

HELI-INTER PHONE (819) 757-3030
TOLL-FREE 866-331-3030
757-3303

HEW CRAFT

DANIEL HAUVER (450) 468-3431
FAX - 5497

HEW LOGISTICS

CAROL MOREAU PHONE (418) 673 6442
FAX (418) 673-~~6442~~ 6472

TAIGA HELICOPTERS (WINNIPEG)
TONY PHONE (204) 943-3645
FAX 943-3657

AIRSPAN HELICOPTERS

STEVE ROGERS

(604) 885-7474

WISK-AIR HELICOPTERS (THUNDER BAY)

MARK WISKEMANN PH: (807) 475-4510
FAX: (807) 473-5485

KEVIN COOKSON - PH - (807) 577-4567

807 475
768 - 7310

NO ME

NORTHERN AIR SUPPORT (250) 765-0077
- ROGER REID

514 508-5081

ROSS

12:30

11:50 - 2:00
- 4:00

- 8:00 - 10:00

SEE JOBS
606 FOR
FURTHER
UPDATES

NORTHERN AIR
SUPPORT
BRIAN HALBERT
845 6274 (403)AC

BRIANHALBERT@
NORTHERNAIRSUPPLY
.COM

M+M No 2452
BARREL NUTS
2752-064 ✓

SOLID Aluminum AFT BEAM 12.2 LB
— WITH POCKETS MILLER IN SIDES 6.8 LB

OLD	407	BASKET	362
NEW	407	BASKET	606

ATTN: DEREK

PRAIRIE HELICOPTERS

fax: (204) 642-4904

FROM: JEFF CLARKE

AERO DESIGN LTD.

ph: (403) 250-8027

CALL IF YOU HAVE ANY QUESTIONS.

Jeff Clarke.

WEIGHT AND BALANCE						
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
02	CARGO BASKET ASSEMBLY	45.0	114.1	5135	38.5	1733
03	FORWARD BEAM (POCKETED)	6.8	76.4	520	17.1	116
04	AFT BEAM (POCKETED)	6.8	151.4	1029	18.0	122
	TOTAL	58.6	114.1	6684	33.6	1971
	CARGO	200 MAX	114.1	22820	38.5	7700

FOR SHIPMENTS WITHIN CANADA

1 SHIPPER'S UPS ACCOUNT NUMBER 101644		FOR UPS USE	
SENDER'S NAME S. JATLEY		TELEPHONE NO. 403 250 8027	
COMPANY NAME AERO DESIGN		DEPT.	
STREET ADDRESS 2013 39TH AVE			
CITY CALGARY	PROVINCE AB	POSTAL CODE T2E 0R7	

2 RECEIVER'S UPS ACCOUNT NUMBER A		FOR UPS USE	
RECEIVER CONTACT PERSON DEREK LANGLY		TELEPHONE NO. 204 642 4841	
COMPANY NAME PRAIRIE HELICOPTERS		DEPT.	
STREET ADDRESS Box 153 Gimli Airport			
CITY Gimli	PROVINCE MB	POSTAL CODE R0C1B9	

3 PRINT CLEARLY - PRESS HARD CUSTOMER REFERENCE NUMBERS (optional)		VERY IMPORTANT	
REFERENCE NUMBER 1	REFERENCE NUMBER 2		

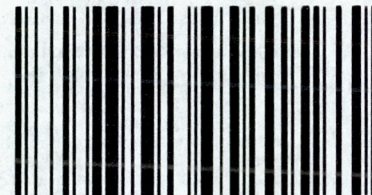
4 BILL CHARGES TO (select only one)				THIRD PARTY'S COMPANY NAME E	
SHIPPER'S UPS ACCOUNT (IN SECTION 1) <input checked="" type="checkbox"/>	AMEX, VISA, DINERS CLUB, MASTERCARD <input type="checkbox"/>	RECEIVER'S UPS ACCOUNT (IN SECTION 2) <input type="checkbox"/>	THIRD PARTY'S UPS ACCOUNT (BELOW) <input type="checkbox"/>		
MAJOR CREDIT CARD NO. OR THIRD PARTY'S UPS ACCOUNT NO. F				EXPIRATION DATE MM YY	



CANADIAN SERVICES WAYBILL

1-800-PICK-UPS®

Affix appropriate tracking label to each additional package.
For additional packages, place tracking label receipts on back of this copy.



E827 283 542 8

UPS WAYBILL / TRACKING NO.

5 SERVICE LEVEL (select only one)	MARK X	UPS USE
EXPRESS EARLY A.M. Guaranteed *next business day by 8:00 a.m. or 8:30 a.m.	<input checked="" type="checkbox"/>	1+
EXPRESS Guaranteed *next business day by 10:30 a.m.	<input checked="" type="checkbox"/>	1
EXPRESS SAVER Guaranteed *next business day by 12:00 noon.	<input checked="" type="checkbox"/>	1P
EXPEDITED Guaranteed *in two business days.	<input checked="" type="checkbox"/>	2
STANDARD Guaranteed *delivery by the scheduled day.	<input checked="" type="checkbox"/>	■

7 ADDITIONAL SERVICES			
<input type="checkbox"/> SATURDAY DELIVERY (AVAILABLE FOR UPS EXPRESS™ EARLY A.M.®, UPS EXPRESS™ AND UPS EXPRESS SAVER™ ONLY)			
<input type="checkbox"/> VERBAL CONFIRMATION OF DELIVERY (AVAILABLE FOR UPS EXPRESS EARLY A.M. ONLY)			
<input type="checkbox"/> OTHER: (specify)			
REGULAR C.O.D. ***			
NO. OF PKGS	C.O.D. AMOUNT PER PACKAGE	NO. OF PKGS	C.O.D. AMOUNT PER PACKAGE

C.O.D. Tags must be attached to each package.

6 SHIPMENT INFORMATION			DECLARED VALUE OF SHIPMENT * *
A UPS EXPRESS ENVELOPE <input type="checkbox"/>	UPS EXPRESS PAK <input type="checkbox"/>	OTHER <input type="checkbox"/>	B NDV
TOTAL NO. OF PACKAGES 1	CHARGEABLE WEIGHT D Actual Weight 20 LB		Dimensional Weight

8 ADDITIONAL HANDLING			
NUMBER OF PACKAGES FOR WHICH THE ADDITIONAL HANDLING CHARGE APPLIES <input type="checkbox"/>			
9 DATE OF SHIPMENT			
MONTH 05	DAY 24	YEAR 2007	
SHIPPER'S SIGNATURE S. JATLEY			
BY SIGNING HERE, THE SHIPPER AGREES THAT THE TERMS LIMITING UPS LIABILITY SET OUT ON THE REVERSE SIDE OF THIS PAGE, APPLY TO THIS SHIPMENT			

AMOUNT RECEIVED		FOR UPS DRIVER USE ONLY		SHIPPING CHARGES	
		CHEQUE CASH <input type="checkbox"/> <input type="checkbox"/>		When applicable, use reverse side of Shipper's Copy to calculate charges. Record total here. \$	
RECEIVED FOR UPS BY: [Signature]				MONTH DAY YEAR TIME 05 24 07 14:01	

THE SHIPPER AGREES THAT THE TERMS LIMITING UPS' LIABILITY SET OUT ON THE REVERSE SIDE OF THE SHIPPER'S COPY APPLY TO THIS SHIPMENT.

SHIPPER'S COPY

028765419714 (REV. 04/05) 5.0MM 01/06-RFD 180195070

GREYHOUND CDA TRANS CORP

GST NO.891646655RT1

WAYBILL NO. 73220527741

GIMLI

MB

COLLECT

CALGARY NORTH 220 168937

04/18/07 3:00 PM 10

ACTUAL WEIGHT 7.0 LBS

DECLARED VALUE 100.00

CONSIGNEE

REF:

1 BOX

PRAIRIE HELICOPTERS INC.

BOX 153

GIMLI MB ROC1B0

204-642-4841

EXPRESS

24.43

FUEL S/C

1.04

GSTMB

1.53

SHIPPER

AERO DESIGN

CALGARY AB

403-250-8027

REFERENCE:

TOTAL

27.00

STATION TO STATION

FORM 256 REV 01/10/03

SHIPPER RECEIPT

LIABILITY LIMITED TO \$50 FOR LOSS OR DAMAGE HOWSOEVER OCCASIONED
UNLESS A GREATER VALUE DECLARED AT TIME OF SHIPPING. REFER TO
TERMS AND CONDITIONS OF CARRIAGE FOR DETAILS OR CONSULT AGENT.



AERO Design Ltd.

(250) 476-1182
Fax (1180)

ENGINEERING CONSULTANTS
TRANSPORT CANADA APPROVALS

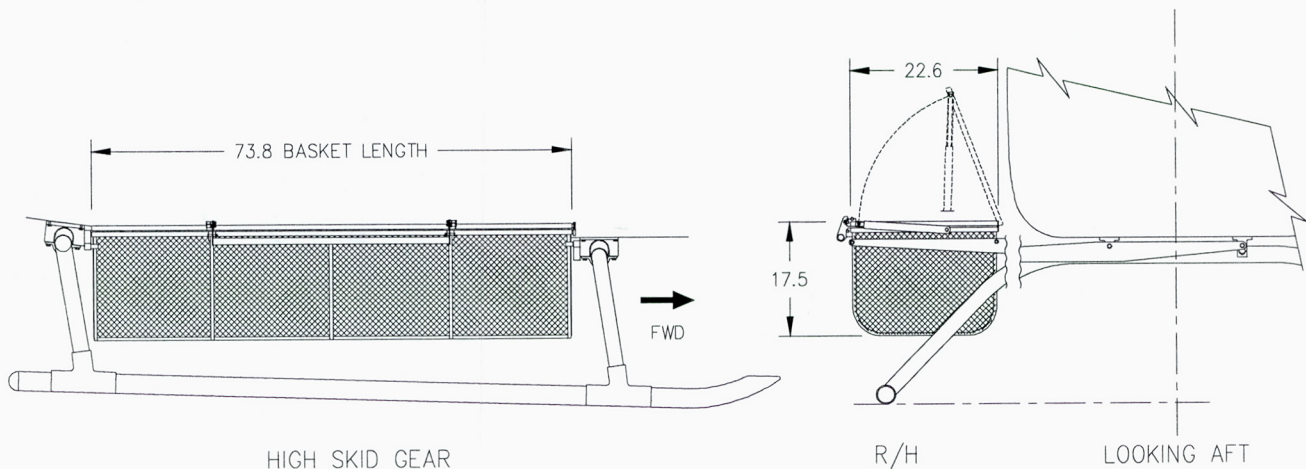
BELL 407 & 206 LONGRANGER EXTERNAL CARGO BASKET



Shown above installed on Bell 206L

FEATURES:

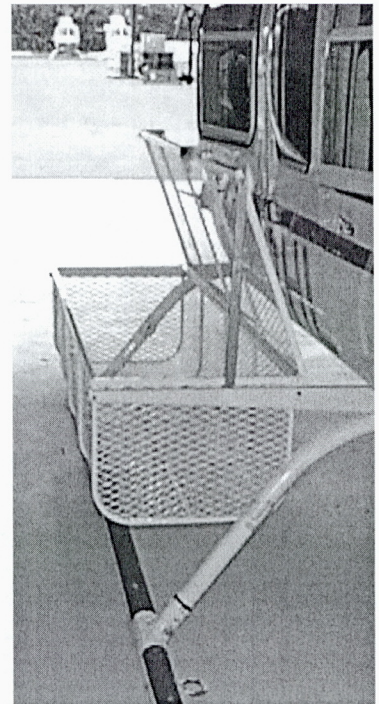
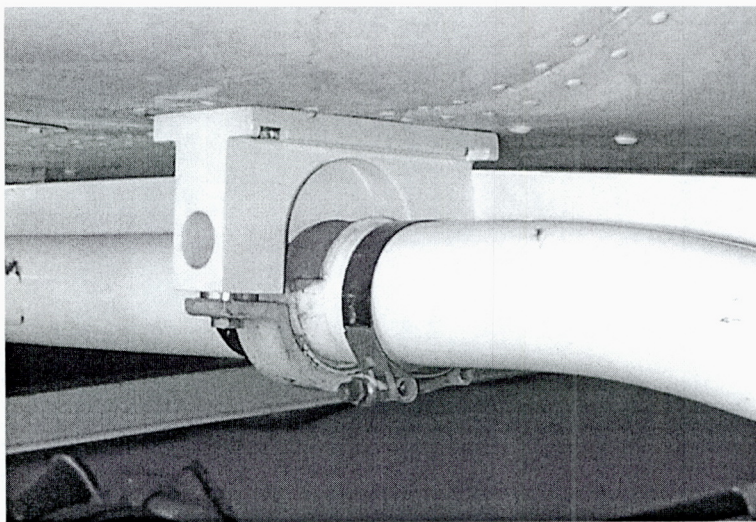
- Carries up to 200 pounds
- Installed on right-hand side
- No airspeed restrictions
- Once provisions are installed, one man can attach and detach basket in minutes
- Lid latches automatically when closed



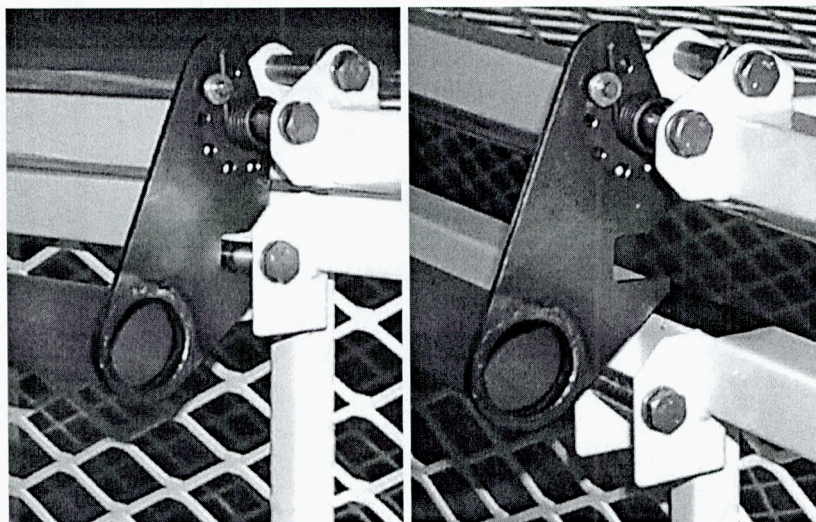
AUDREY
YOU CAN SEE WHY THIS
WOULDN'T WORK ON LOW-
SKIDS.
STEVE

BELL 407 & 206 LONGRANGER EXTERNAL CARGO BASKET

This installation incorporates a set of bolt-on landing gear fittings that provide attachment points for the beams of the basket.



AERO Design Ltd.'s cargo baskets also feature an ingenious automatic locking mechanism on the handle, allowing easy opening, and drop-down closing that keeps the lid shut.



**HANDLE DOWN AND LOCKED
LIFT TO RELEASE AND OPEN**

**SPRING-LOADED HANDLE
READY TO LOCK CLOSED**

AUDREY THIS COULD WORK
BETTER, BUT WOULD
NEED APPROVAL ON THE
206L - CAN BE DONE.
STEVE

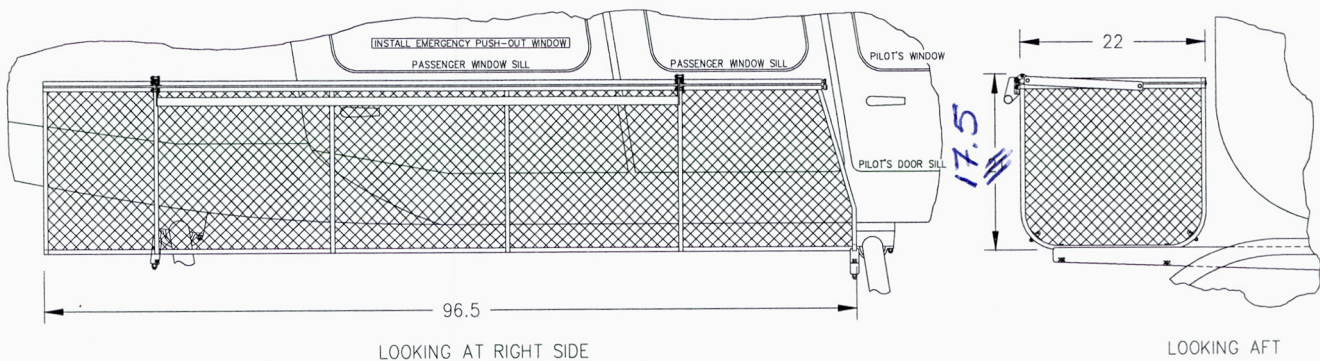
BELL 407 EXTERNAL CARGO BASKET



Note: Pop-out floats are **NOT** compatible with this installation

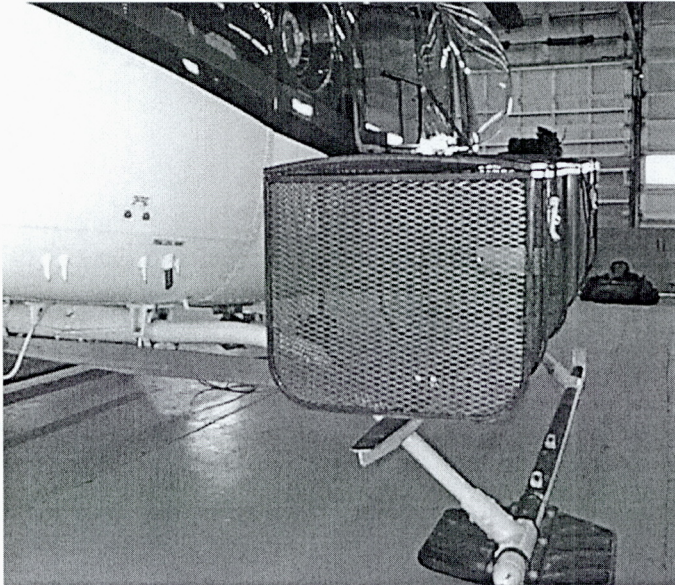
FEATURES:

- Carries up to 200 pounds
- Installed on right-hand side
- No airspeed restrictions
- Once provisions are installed, one man can attach and detach basket in minutes
- Lid latches automatically when closed

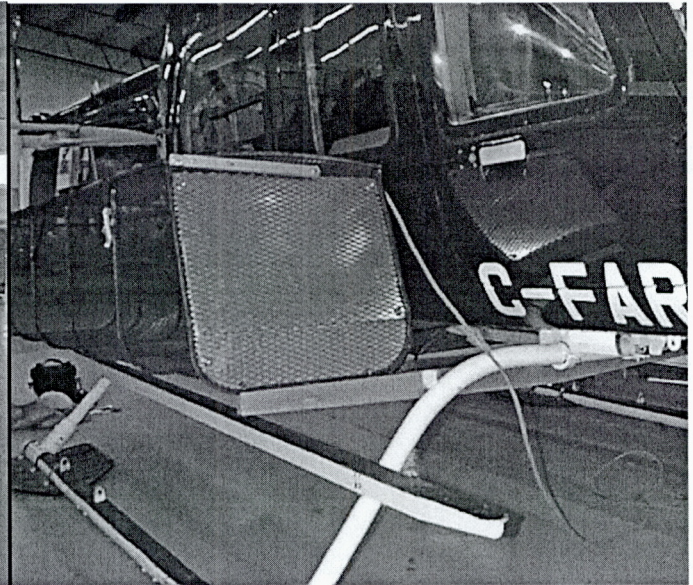


BELL 407 EXTERNAL CARGO BASKET

This installation uses a set of bolt-on beams that attach to the existing landing gear fittings.

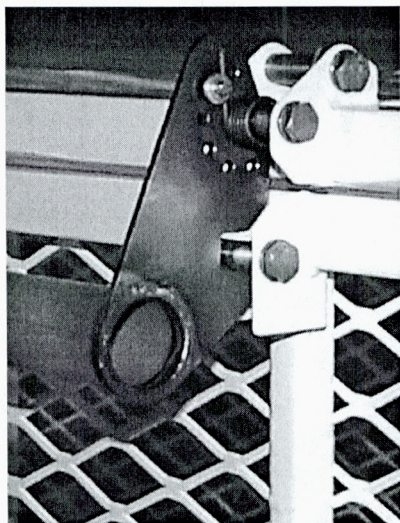


View Looking Forward

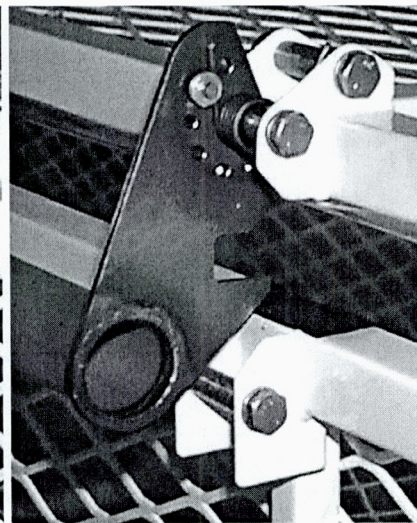


View Looking Aft

AERO Design Ltd.'s cargo baskets also feature an ingenious automatic locking mechanism on the handle, allowing easy opening, and drop-down closing that keeps the lid shut.



**HANDLE DOWN AND LOCKED
LIFT TO RELEASE AND OPEN**



**SPRING-LOADED HANDLE
READY TO LOCK CLOSED**

Canadian
Freightways

CF CANADIAN FREIGHTWAYS

JUST TELL US WHERE AND WHEN

STRAIGHT BILL OF LADING - NOT NEGOTIABLE

DATE

MARCH 2/06

WINNIPEG \$76.81
W. TO T.B. \$?

GUARDLINE
WISK-AIR HAS AN
ACCOUNT WITH G.

AFFIX

PRO NO.
327-250545

HERE

SHIPPER'S NUMBER

BILL OF LADING NUMBER

PURCHASE ORDER NUMBER

SHIPPER ACCOUNT NUMBER

CONSIGNEE ACCOUNT NUMBER

SHIPPER (FROM)

AERO DESIGN LTD.

CONSIGNEE (TO)

WISKAIR HELICOPTERS

STREET

2013 39th AVE NE

STREET

520 ORVILLE WIEBEN CRES.

CITY/PROVINCE

CALGARY, AB

POSTAL CODE

T2E6R7

CITY/PROVINCE

THUNDER BAY, ON

POSTAL CODE

P7E6M9

FAX NUMBER

(403) 250-8333

Ph: (403) 250-8027

FAX NUMBER

(807) 473-5485

Ph: (807) 475-4510

SPECIAL INSTRUCTIONS

ROUTING

SPECIAL SERVICES: Refer to Canadian Freightways Guaranteed Service Sheets for service availability from your area.
(Additional charges will apply) If a special service is not selected, this shipment will move according to Canadian Freightways regular service standards.

CF Quote Number:

Guaranteed Time Definite Delivery Service:

before 10:30 am ☐
before 9:00 am ☐
before 7:00 am ☐

CF DaySaver

☐

CF Prime Time:

☐

CF Prime Time Plus:

☐

Enter quote number in space above.
Quote number required prior to
shipping. Please call the CF Business
Centre 1-800-561-5555.

Canadian Freightways Air:

☐ Overnight ☐ Second Day ☐ Third Day

Enter quote number in space above

PIECES	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	DANGEROUS GOODS			WEIGHT (LBS)	RATE	FREIGHT CHARGES SHIPPER TO CHECK
		CLASS	P.I.N.	PKG. GRP.			
1	METAL MESH BASKET / PARTS				70		<input type="checkbox"/> PREPAID
	DOCUMENTS						<input checked="" type="checkbox"/> COLLECT
							If not indicated, shipment will automatically move collect.
							C.O.D.
							AMOUNT
							\$
							C.O.D. FEE
							<input type="checkbox"/> PREPAID
							<input type="checkbox"/> COLLECT

EMERGENCY RESPONSE TELEPHONE NO. TYPE OF PLACARD QUANTITY EMERGENCY RESPONSE PLAN NO.

DECLARED VALUATION:

Maximum liability of carrier is \$2.00 per lb.
(\$4.41 per kilogram) unless declared valuation states otherwise.
On shipments moving within Canada an excess valuation charge of 1%
will be assessed on valuation in excess of \$10.00 per pound. On
shipments moving from Canada to the U.S. an excess valuation charge
of 1% will be assessed on valuation in excess of \$2.00 per pound.

\$

DIMENSIONS

76" x 24" x 18"

TOTAL CUBIC FEET

NOTICE OF CLAIM: (a) No carrier is liable for loss, damage or delay to any goods under the Bill of Lading unless notice thereof setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the originating carrier or the delivering carrier within sixty (60) days after the delivery of the goods, or, in the case of failure to make delivery, within nine (9) months from the date of shipment. (b) The final statement of the claim must be filed within nine (9) months from the date of shipment together with a copy of the paid freight bill.

RECEIVED at the point of origin on the date specified, from the consignor mentioned herein, the property herein described, in apparent good order, except as noted (contents and conditions of contents of package unknown) marked, consigned and destined as indicated below, which the carrier agrees to carry and to deliver to the consignee at the said

destination, if on its own authorized route or otherwise to cause to be carried by another carrier on the route to said destination, subject to the rates and classification in effect on the date of shipment.

It is mutually agreed, as to each carrier of all or any of the goods over all or any portion of the route to destination, and as to each party of any time interested in all or any of the goods, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, including conditions set aside by the standard bill of lading, in power at the date of issuing, which are hereby agreed by the consignor and accepted for himself and his assigns.

The Contract for the carriage of the goods listed in the bill of lading is governed by regulation in force in the jurisdiction at the time and place of shipment and is subject to the conditions set out in such regulations.

PER *Clarke*

PER

CARRIER
CANADIAN FREIGHTWAYS

UNIT NUMBER

349-109

DATE

3/2/06

TIME

SHIPPER
AERO DESIGN LTD.

For shipment tracking visit: www.canadianfreightways.com

0001 (02-01)

SHIPPER'S COPY

NUMBER OF PIECES RECEIVED ▲

PACKING SLIP

28 February, 2006

Address:

WiskAir Helicopters
520 Orville Wieben Cres.
Thunder Bay ON
P7E 6M9

Attention:

Alex Turner

Reference: Your Purchase Order: _____

Quantity Ordered	Quantity Shipped	Description	Part Number
1	1	200 Lb Cargo Basket Assy (S/N 49201-23)	49205-01
1	1	Forward Support Beam	49221-01
1	1	Aft Support Beam	49221-02
4	4	Bolt	AN4-23A
12	12	Washer	AN960-416
4	4	Nut	MS21044N4
4	4	Bolt	AN6-17A
4	4	Washer	AN960-616
2	2	Barrel Nut	49320-01
1	1	Supplemental Type Certificate	STC SH00-48
1	1	Document Control List	DCL606
1	1	Flight Manual Supplement	FMS606.01
1	1	Installation Drawing – Cargo Basket	60601
1	1	Maintenance Instructions	MI 606.01

PACKING SLIP

22 February, 2006

Address:

WiskAir Helicopters
520 Orville Wieben Cres.
Thunder Bay ON
P7E 6M9

Attention:

Alex Turner

Reference: Your Purchase Order: _____

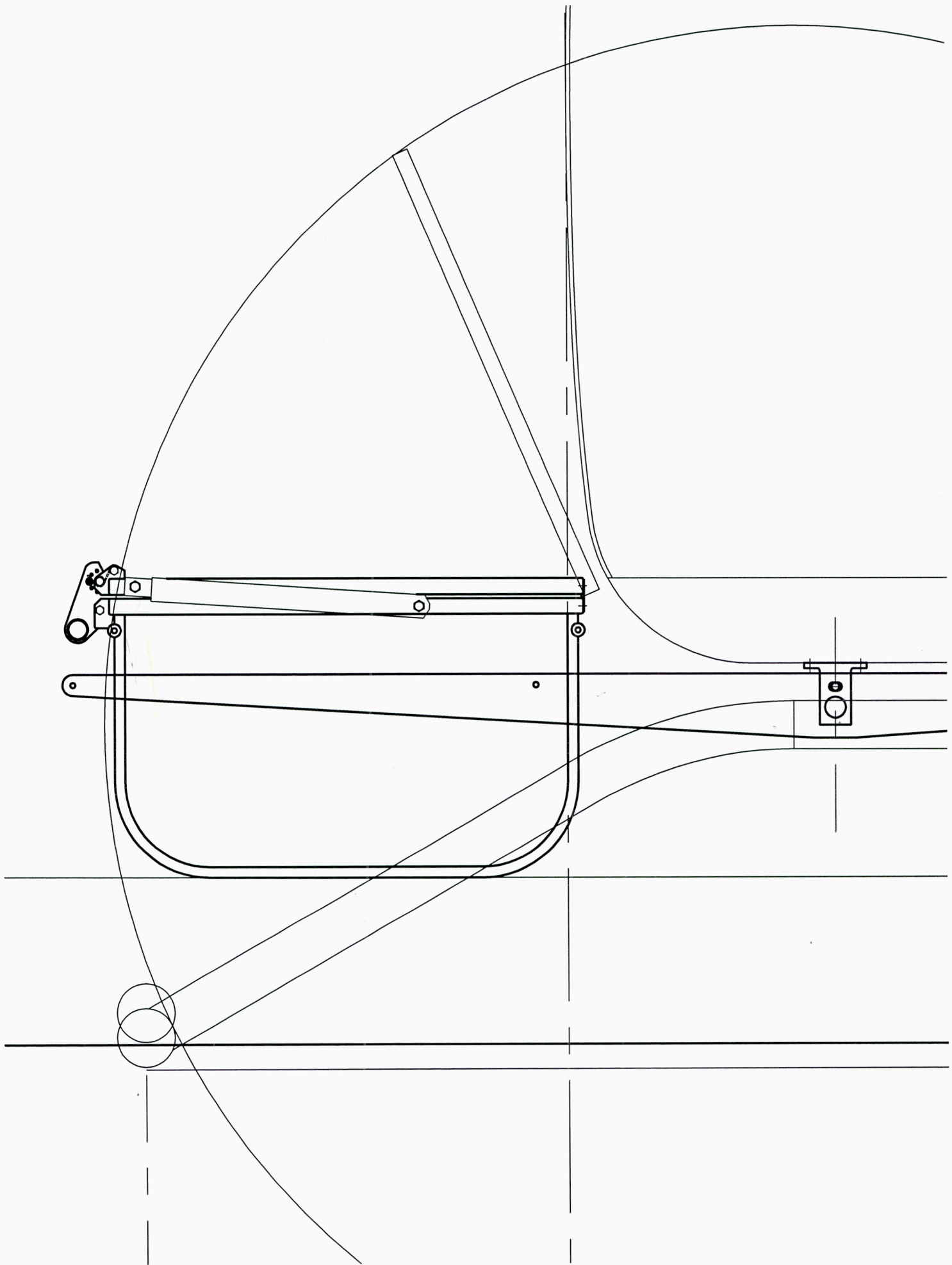
Quantity Ordered	Quantity Shipped	Description	Part Number
2	2	Forward External Attachment Fitting	60621-01
2	2	Block	60620-01
2	2	Barrel Nut	60622-01
2	2	Barrel Nut	60624-01
2	2	Bolt	NAS6206-11
1	1	R.H. Step Assembly	62320-01
2	2	Bolt	AN4-16A
4	4	Washer	AN960-416
2	2	Nut	MS21044N4
1	1	Installation Drawing – Attachment Provisions	60602
1	1	Installation Drawing – Step	

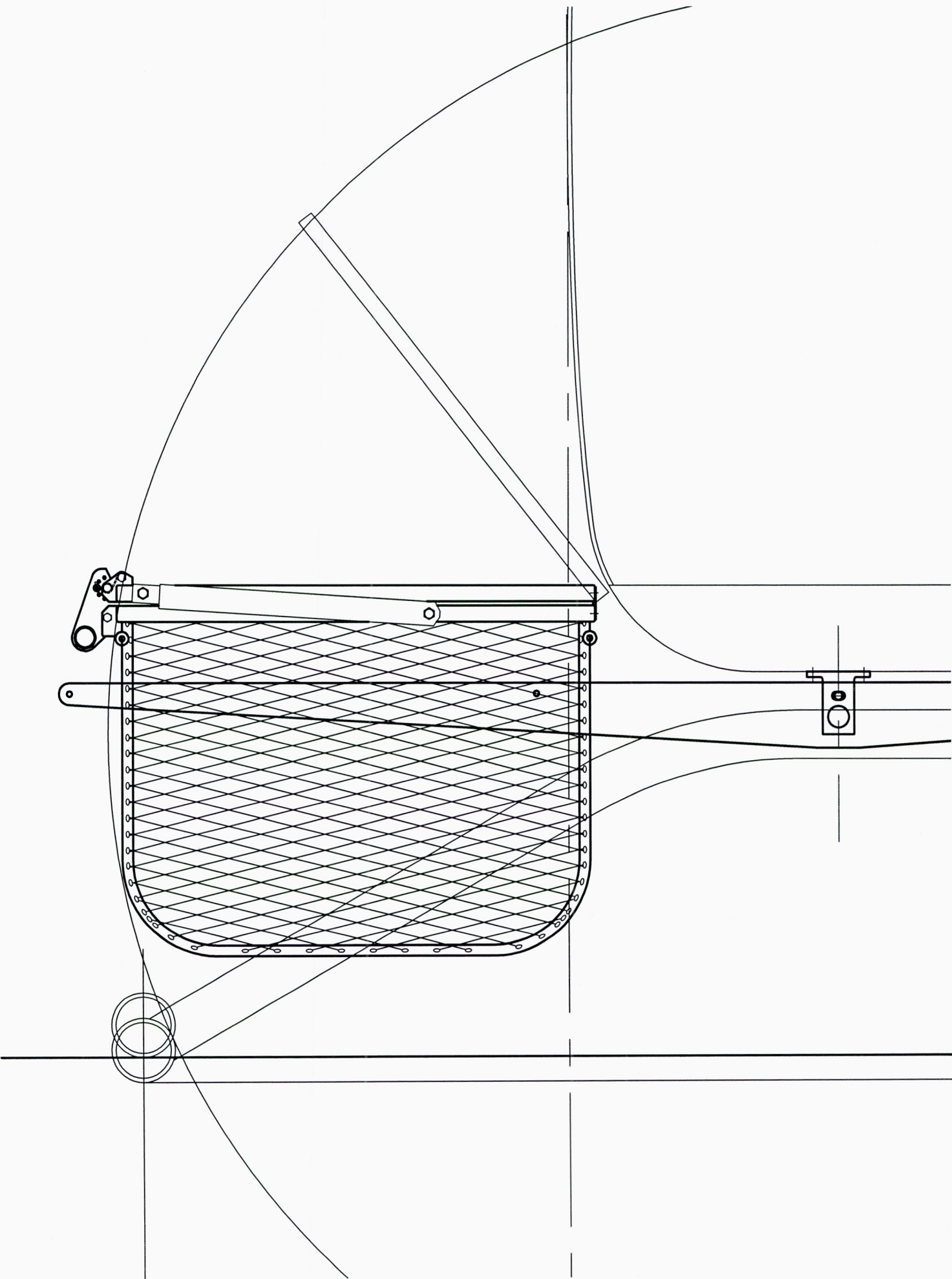
Aero Design

From: "Mike & Audrey King" <whitesaddleair@lincsat.com>
To: <aerodesign@telusplanet.net>
Sent: February 18, 2005 10:27 AM
Attach: IMG_255.jpg
Subject: IMG_0254.JPG



IMG_0254.JPG





1 November, 2007

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File # : SH00-48

Our File # : Various

Re: Cargo Basket Approval Revisions

Jack,

Please find attached the following documents related to this project:

Supplemental Type Certificate (draft)

✓SH00-48 Issue 6

(High Quick Release Basket)

Document Control List

✓DCL766-1 Revision 0

Document Control List

✓DCL766-2 Revision 0

AE 100 Form

✓AE766-1 Revision 0

AE 100 Form

✓AE766-2 Revision 0

Compliance Program

✓CP766 Revision 0

Modification Approval Application Form

✓MOD766 Revision 0

Engineering Report

✓ER766.01 Revision 0

Test Plan

✓TP766.02 Revision 0

Instructions for Continued Airworthiness

✓ICA766.90 Revision 0

MSI 53 Review

Flight Manual Supplement (407)

✓FMS766.91 Revision 0

Flight Manual Supplement (206L)

✓FMS766.92 Revision 0

Cargo Basket Installation

✓76601 Revision 0

Cargo Basket Assembly

✓76610 Revision 0

Cargo Basket Body

✓76611 Revision 0

Basket Components - End Hoop Assembly

✓76621 Revision 0

Basket Comp. - Attach Hoop Assembly

✓76622 Revision 0

Basket Components - Hoop

✓76623 Revision 0

Basket Components - Placard

✓76625 Revision 0

Support Beams

✓76630 Revision 0

Handle Assembly

✓36255 Revision 1

Handle Bar Assembly

✓36261 Revision 3

Handle Bracket Assembly

✓36262 Revision 1

Handle Lever

✓36271 Revision 1

Basket Bracket

✓36272 Revision 1

Lid Bracket

✓36273 Revision 1

Bushing

✓36274 Revision 1

Bushing

✓36275 Revision 2

AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

info@aerodesign.ca

(407 Attachment Provisions)

Document Control List

AE100 Form

Block Fabrication

✓ DCL700 Revision 1
✓ AE700 Revision 1
✓ 60620 Revision 1

(Low Fixed Basket)

Document Control List

Document Control List

AE100 Form

Cargo Basket Installation (206L)

Support Beams (Pocketed Aluminum)

Support Beams (Steel)

Engineering Report - Pocketed Beams

Instructions for Continued Airworthiness

Flight Manual Supplement

Document Control List

AE100 Form

Cargo Basket Installation (407)

Flight Manual Supplement

✓ DCL492 Revision 6
✓ DCL492-1 Revision 1
✓ AE492 Revision 2
✓ 49201 Revision 3
✓ 49221 Revision 3
✓ 49222 Revision 2
✓ ER492.04 Revision 1
✓ ICA492.90 Revision 1
✓ FMS492.01 Revision 2
✓ DCL606 Revision 3
✓ AE606 Revision 2
60601 Revision 2
✓ FMS606.01 Revision 2

(Quick Release Basket Installation)

Document Control List

AE100 Form

Cargo Basket Installation (407)

Flight Manual Supplement

Document Control List

AE100 Form

Cargo Basket Installation (206L)

Flight Manual Supplement

✓ DCL701 Revision 1
✓ AE701 Revision 1
✓ 70101 Revision 2
✓ FMS701.90 Revision 1
✓ DCL702 Revision 1
✓ AE702 Revision 1
✓ 70201 Revision 2
✓ FMS702.90 Revision 1

(Quick Release Basket Fabrication)

Document Control List

AE100 Form

Cargo Basket Assembly

Basket Body Assembly

Basket Components - End Hoop

Basket Components - Aft Hoop

Instructions for Continued Airworthiness

Document Control List

AE100 Form

Forward Beam Fabrication

Aft Beam Fabrication

Engineering Report

✓ DCL698-1 Revision 1
✓ AE698-1 Revision 1
✓ 69810 Revision 2
✓ 69811 Revision 2
✓ 69821 Revision 1
✓ 69822 Revision 0
✓ ICA698.90 Revision 1
✓ DCL698-2 Revision 2
✓ AE698-2 Revision 1
✓ 69830 Revision 2
✓ 69831 Revision 2
✓ ER698.04 Revision 0

AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

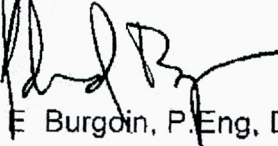
Tei 403-250-8027

Fax 403-250-8333

info@aerodesign.ca

Please note the request for a revision to the FAA STC after the Canadian approval is issued.


Regards,

A handwritten signature in black ink, appearing to read 'F. Burgoin', is written over the printed name.


F. Burgoin, P. Eng, DAR 290M

Encl.

FORM AE-100

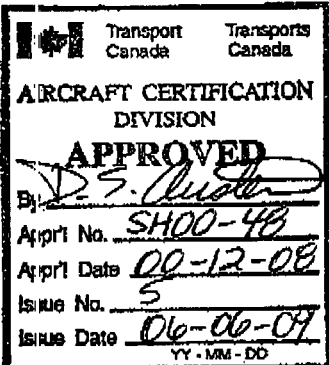
DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE492 Initial Issue Date: 21 June, 2002 Revision: 2 Revision Date: 1 November 2007 Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd
Aircraft Mfr: Bell Aircraft Model: 206L Series Registration:	Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	
LIST OF APPROVED REPORTS AND DATA		
Document Number	Document Title	Compliance Status
DCL492-1 DCL492 49201 49221 49222 ER492.04 ICA492.90 FMS492.01 36261 36271 36272 36273 36274 36275	Revision 1 Revision 6 Revision 3 Revision 3 Revision 2 Revision 0 Revision 1 Revision 2 Revision 3 Revision 1 Revision 1 Revision 1 Revision 1 Revision 2	Document Control List and all documents referred to therein Document Control List and all documents referred to therein Cargo Basket Installation Support Beams Support Beams (Steel) Engineering Report – Pocketed Beams Instructions for Continued Airworthiness Flight Manual Supplement (only unapproved sections revised) Handle Bar Assembly Handle Lever Basket Bracket Lid Bracket Bushing Bushing
DATA APPROVED BY TRANSPORT CANADA		
CERTIFICATION		
UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HERBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIRMENTS.		
I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA		
 E. Burgoin, DAR 290M		

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components - Hoops	1
49211	Basket Components - Rim	1
49212	Basket Components - Rim	0
49213	Basket Components - Lid Brace	1
49214	Basket Components - Spine	0
49215	Basket Components - Spacer	0
49216	Basket Components - Spacer	0
49217	Basket Components - Lug	1
49218	Placard	1
49221	Support Beams	1
49222	Support Beams (Steel)	0
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report - Basket Installation	0
ER492.02	Engineering Report - Basket Load Tests	0
ER492.03	Engineering Report - Steel Beams	0
APPROVAL:		
 Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <i>D.S. Austin</i> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>5</u> Issue Date <u>06-06-09</u> <small>YY-MM-DD</small>		ORIGINAL DATE: 4 May, 2006 REVISION DATE:
SHEET 1 OF 1		AERO DESIGN LTD. 2013 - 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
DCL492-1		Rev. 0
Side-Mounted Cargo Basket Assembly		

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS 49201 FMS492.01 ICA492.90	Cargo Basket Installation Flight Manual Supplement Instructions for Continued Airworthiness	2 1 0
FABRICATION DOCUMENTS DCL492-1	Document Control List for Side-Mounted Cargo Basket Assembly	0
ENGINEERING DOCUMENTS		

APPROVAL: 	ORIGINAL DATE: 17 May, 2002 REVISION DATE: 10 May, 2006	AERO DESIGN LTD. 2013 - 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	DCL492	Rev. 5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Fixed Cargo Basket on Bell 206L Series/407
Certification Basis of design change and revision date:	FAR 27, Amendment 27-30
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 492.90)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 49201, 60601

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 206L Series/407 Maintenance Manuals, BHT-206L-MM BHT-206L1-MM BHT-206L3-MM BHT-206L4-MM BHT-407-MM	Supplemental ICA ref: Single Manual (ICA492.90)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 206L Series/407 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5, 0-6
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-4
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-5
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 206L Series/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-6
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."

ICA ref: Bell 206L Series/407
Maintenance Manual, Chapter 4

Supplemental ICA ref: Chapter 4

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: _____

Date: _____

5 MAY 2006

Applicants Name: _____ E. Burgoin, P.Eng, DAR 290M

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number _____

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 492.90

LOW MOUNTED CARGO BASKET

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Low Mounted Cargo Basket assembled in accordance with AERO Design Ltd. Document Control List DCL492-1, Revision 0, or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 4 May, 2006

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 4 May, 2006

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-6	0
04-00-00	7	0
05-00-00	8-10	0
11-00-00	11	0
25-50-00	12-14	0

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for the rotorcraft embodying the Low Mounted Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Low Mounted Cargo Basket. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The cargo basket installation is a metal mesh basket installed to the side of the helicopter on beams attached to landing gear fittings with attachment provisions incorporated.

The basket itself is 73.6" long, 22.5" wide, and 17" high. It is made of a 4130 steel welded tubing structure, and lined with expanded steel mesh. The basket has a hinged lid with a self-locking handle.

The beams are aluminum flat bar or steel tubing which attach to the landing gear fittings and stick out from the side of the helicopter.

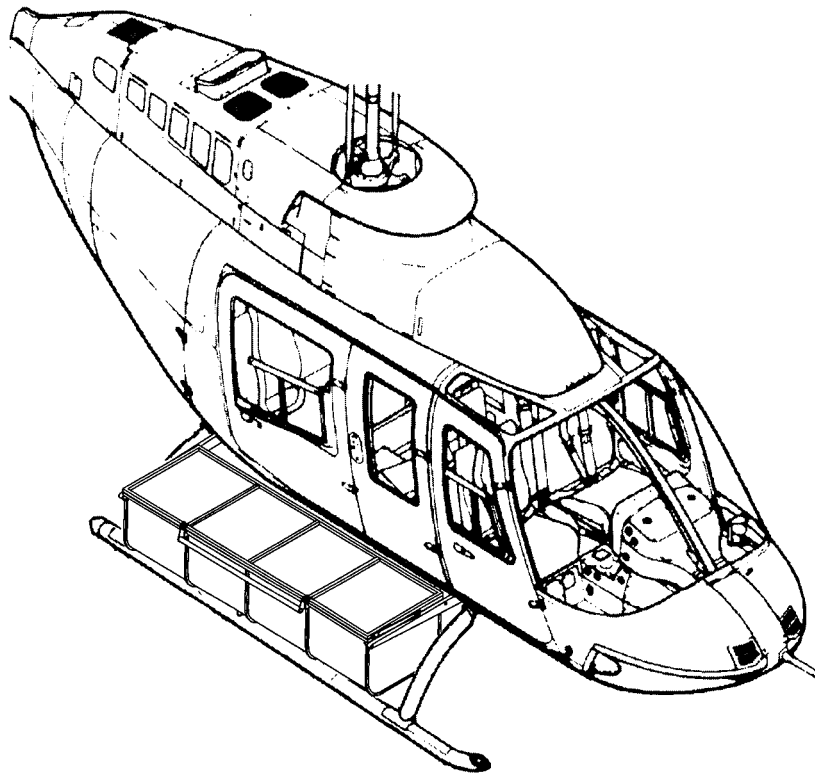


Figure 1 – Basket Installation

0-6 STRUCTURAL PROVISIONS

The External Attachment Provisions are installed on the helicopter in accordance with drawing 49301 (Bell 206L Series) or 60602 (Bell 407). That installation is separate from the basket installation. The External Attachment Provisions are not included in this ICA.

The external attachment provisions consist of replacement landing gear fittings that incorporate a barrel nut for installing equipment. Each fitting is bolted to the lower fuselage and landing gear with the same fasteners as used for the original fittings, as shown in Figure 2.

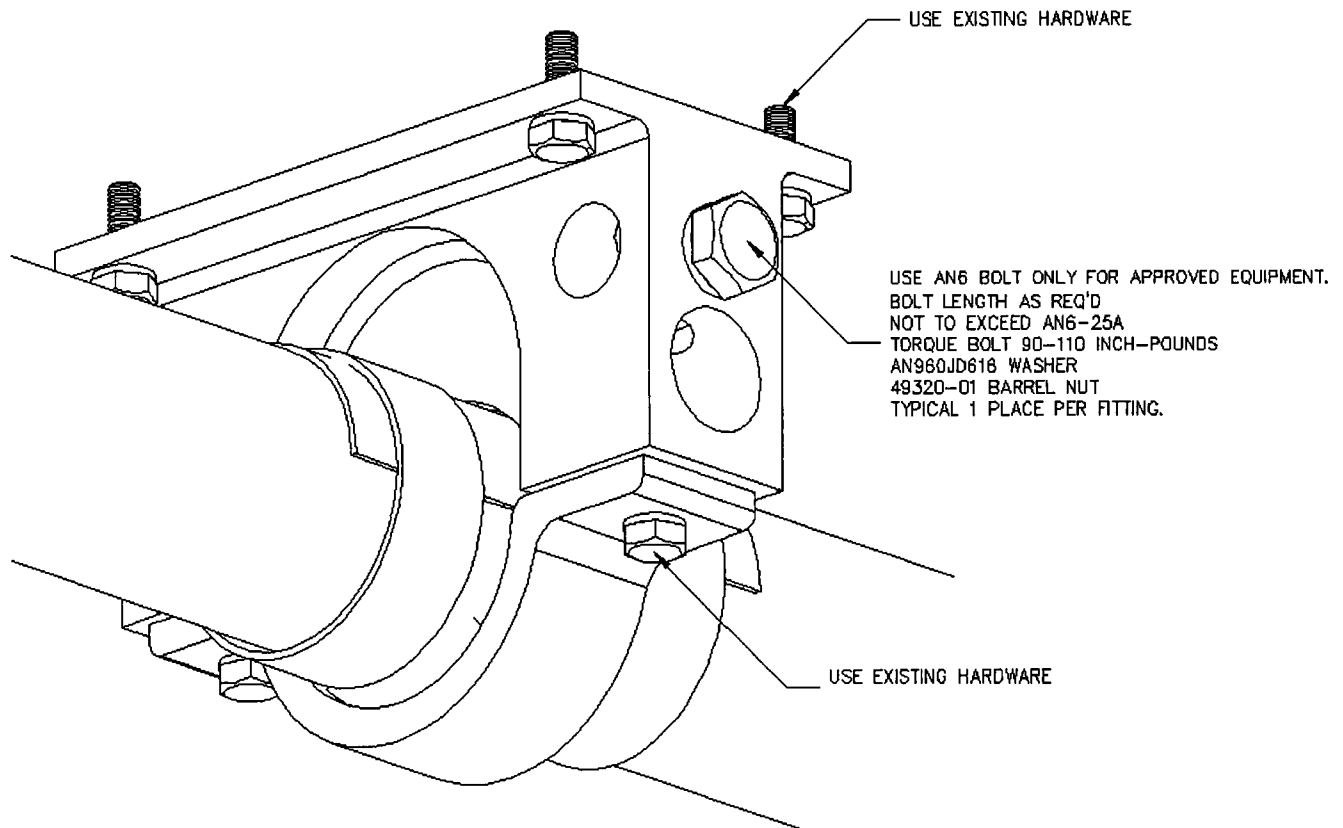


Figure 2 - Installation of External Attachment Provisions

CHAPTER 4 – AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is Transport Canada-approved and specifies maintenance required under Section 571 of the Canadian Aviation Regulations, unless an alternative program has been approved.

No additional airworthiness limitations have been imposed due the installation of the Low Mounted Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Low Mounted Cargo Basket.

Daily Inspection

1. Inspection Area: Basket
 - a) Inspect latching of the lid for correct operation. If basket is bent inward the lid will close but may not latch.

300 Hour or Annual Inspection

1. Inspection Area: Basket
 - a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
 - b) Visually inspect basket mesh for damage.
2. Inspection Area: Beams
 - a) Visually inspect beams attaching basket to the helicopter for cracks, corrosion or other damage.
 - b) Visually inspect bolts attaching the basket to the beams for security and damage.
 - c) Visually inspect bolts attaching beams to external attachment provisions for security and damage.

Special Inspections

Following a hard landing inspect the Low Mounted Cargo Basket installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket

- a) Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
- b) Basket is fabricated from the following materials:
 - Lid and Rim: $\frac{3}{4}$ " x 0.035" square 4130 steel tube
 - Frames: $\frac{1}{2}$ " x 0.035" square 4130 steel tube
 - Mesh: $\frac{3}{4}$ " 16 ga. (0.040") expanded carbon steel mesh
- c) Touch up with polyurethane paint as required following repairs.

2. Beams (Aluminum)

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) Nicks on the corners up to 0.125" deep may be dressed out.
- d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing
- f) Touch up with polyurethane paint as required following repairs.

3. Beams (Steel)

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) Touch up with polyurethane paint as required following repairs.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams (Aluminum)

The beams are supplied painted white. If the paint is damaged, touch up with white polyurethane paint.

2. Beams (Steel)

The beams are supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

3. Cargo Basket

The cargo basket is supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Low Mounted Cargo Basket Installation in the locations noted:

- a) Located on basket lid:



- b) Located on top of aluminum forward beam: 49221-01
c) Located on top of aluminum aft beam: 49221-02
d) Located on top of steel forward beam: 49222-01
e) Located on top of steel aft beam: 49222-02

CHAPTER 25 – EQUIPMENT AND FURNISHINGS

SECTION 50 – CARGO COMPARTMENTS

25-1 BEAMS INSTALLATION

Refer to Figure 3

1. External Attachment Provisions installed in accordance with drawing 49301 (Bell 206L Series) or 60602 (Bell 407) are required prior to installing the Beams.
2. Locate 49221-01 Forward Beam (49222-01 alternate) on aft side of Forward Landing Gear Fittings. Install two AN6-20A Bolt and AN960-616 Washer into Barrel Nuts in Fittings. Torque AN6 bolts to 90-110 in-lbs.
3. Locate 49221-02 Aft Beam (49222-02 alternate) on forward side of Aft Landing Gear Fittings. Install two AN6-20A Bolt and AN960-616 Washer into Barrel Nuts in Fittings. Torque AN6 bolts to 90-110 in-lbs.

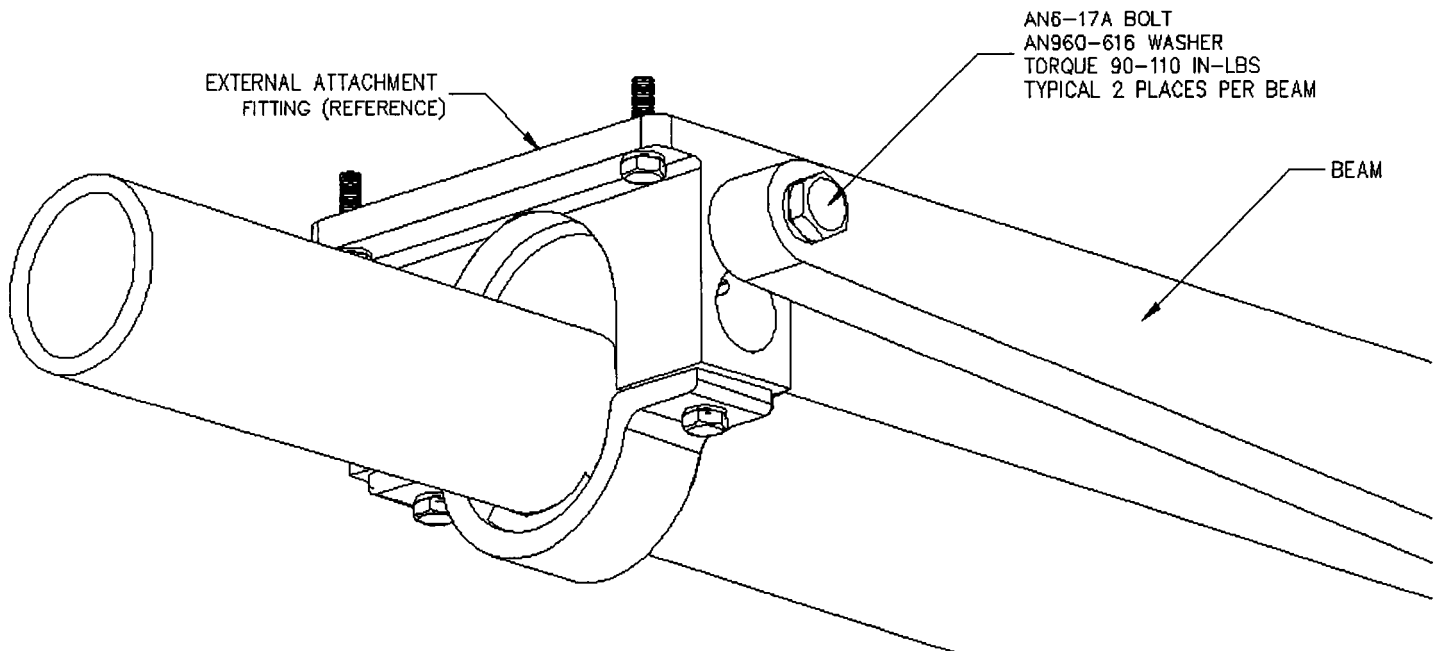


Figure 3 – Beams Installation/Removal

25-2 BEAMS REMOVAL

Refer to Figure 3

1. Remove Cargo Basket. Refer to section 25-4.
2. Remove two AN6-20A Bolt and AN960-616 Washer from Forward Beam. Remove Forward Beam.
3. Remove two AN6-20A Bolt and AN960-616 Washer from Aft Beam. Remove Aft Beam.

25-3 BASKET INSTALLATION

Refer to Figure 4

1. Locate basket in position between beams. Insert one (1) AN4-23A Bolt with AN960-416 Washer through inboard hole on beam at forward and aft end of basket.
2. Swing basket up and insert one (1) AN4-23A Bolt with AN960-416 Washer through outboard hole on beam at forward and aft end of basket.
3. Install one (1) AN960-416 Washer and MS21044N4 Nut on each AN4 bolt. Torque AN4 Bolts to 50-70 in-lbs.

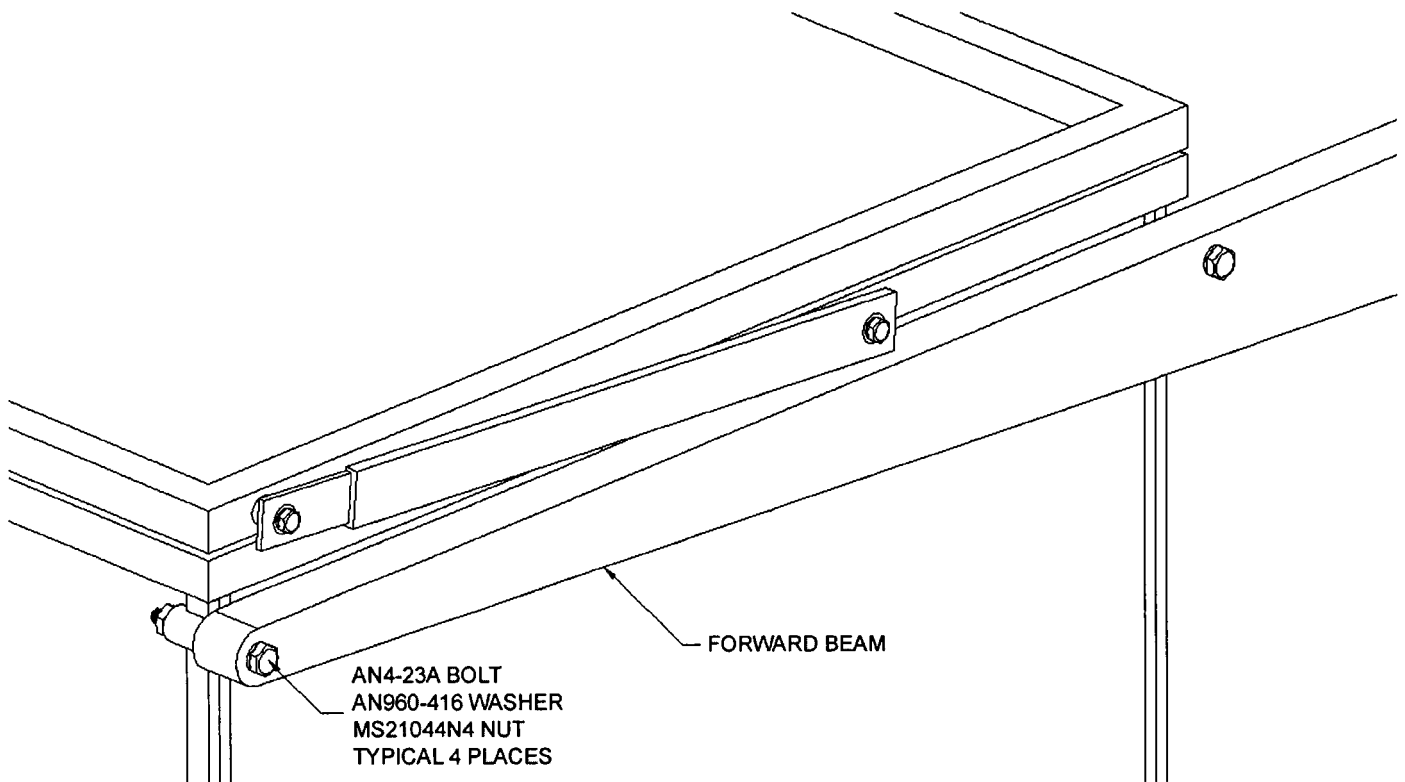


Figure 4 – Basket Installation/Removal

25-4 BASKET REMOVAL

Refer to figure 4.

1. Remove four (4) AN4-23A Bolts, eight (8) AN960-416 Washers and four (4) MS21044N4 Nuts securing basket to beams.
2. Remove basket from helicopter.

25-5 WEIGHT AND BALANCE

Configuration 1 – Aluminum Beams		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
49221-01	Forward Beam	13.0	76.4	993.2	16.7	217.1
49221-02	Aft Beam	12.3	151.4	1862.2	17.6	216.5
49205-01	Cargo Basket	43.0	114.1	4906.3	38.5	1655.5
Total		68.3	113.6	7761.7	30.6	2089.1

Configuration 2 – Steel Beams		Weight (lbs)	Longitudinal		Lateral	
Part #	Name		Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
49222-01	Forward Beam	12.0	76.4	916.8	18.0	216.0
49222-02	Aft Beam	11.3	151.4	1710.8	19.6	221.5
49205-01	Cargo Basket	43.0	114.1	4906.3	38.5	1655.5
Total		66.3	113.6	7533.9	31.6	2093.0

25-6 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

AERO Design Ltd.

**ENGINEERING REPORT
ER492.03**

STEEL BEAMS

Approved: E. Burgoin, P. Eng.

Revision 0
Date: 15 May, 2006

AERO Design Ltd.
Engineering Consultants

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1.0 INTRODUCTION

In order to simplify fabrication of the beams it is desirable to use steel tubing instead of solid aluminum. The use of steel allows all fabrication to be performed "in-house". The beams can then be powder coated, which is more durable than paint.

2.0 REFERENCE

AERO Design Ltd. drawing 49222

MIL-HDBK-5

3.0 BASIS OF CERTIFICATION

Bell 407, TCDS H-92 (Highest of Bell 206L series and 407):

FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30; Paragraph 27.561(b)(3) at Amdt 27-24; Section 27.563 at Amdt. 27-25; Section 27.785 at Amdt 27-24; Section 27.1093 at amendment 27-8; and Section 27.173 and 27.175 at amendment 27-1.

Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1).

This installation:

Same as the basis of certification as shown the Type Certificate Data Sheet.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

AD CF-2004-03 relates to high stresses imposed on the landing gear cross tubes during run on landings, and introduces an RIN (Retirement Index Number) on the landing gear cross tubes. This installation does not affect compliance with AD CF-2004-03.

Two AD's requiring a lower V_{NE} have been issued (CF-1998-36, CF-2001-01). CF-2001-01 has been rescinded. CF-1998-36 is still in effect. This installation does not affect compliance with AD CF-1998-36, as the flight manual supplement states that if the V_{NE} of the existing flight manual is more restrictive to use the lower value.

5.0 LOADS

BELL 407 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} := 1.5$
Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} := 4.0$
Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} := 2.0$
Ultimate Downward Emergency Landing Load Factor:	$n_{e_down} := 4.0$

FAR 27.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

FAR 27.303 Safety Factor: $n_{sf} := 1.5$

FAR 27.337(a) Limit Positive Maneuvering LoadFactor: $n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$ Ultimate Positive Maneuvering LoadFactor: $n_{man_ult} = 5.25$

Limit Negative Maneuvering LoadFactor: $n_{man_n} := -1.0$

$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$ Ultimate Negative Maneuvering LoadFactor: $n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Maneuvering LoadFactor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.1 Inertia Loads

$$W_{\text{basket}} := 55 \cdot \text{lbf} \quad \text{Weight of basket}$$

$$W_{\text{cargo}} := 200 \cdot \text{lbf} \quad \text{Weight of cargo (max)}$$

$$W_{\text{beam}} := 10 \cdot \text{lbf} \quad \text{Weight of beam (each)}$$

$$W_{\text{total}} := W_{\text{basket}} + W_{\text{cargo}} + W_{\text{beam}} \cdot 2$$

$$W_{\text{total}} = 275 \cdot \text{lbf} \quad \text{Total weight of basket installation (with cargo)}$$

The aft beam is critical as the spacing on the helicopter attachments are closer on the aft beam than on the forward beam.

Assuming 1/2 cargo is at the aft end:

$$P_{\text{end}} := \frac{W_{\text{basket}}}{2} + \frac{W_{\text{cargo}}}{2} + W_{\text{beam}}$$

$$P_{\text{end}} = 138 \cdot \text{lbf} \quad \text{Total weight on aft end of basket}$$

$$P_{\text{ult}} := P_{\text{end}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult}} = 722 \cdot \text{lbf} \quad \text{Ultimate load due to basket installation on aft beam (1/2 cargo)}$$

Assuming 2/3 cargo is at the aft end:

$$P_{\text{end}} := \frac{W_{\text{basket}}}{2} + W_{\text{cargo}} \cdot \frac{2}{3} + W_{\text{beam}}$$

$$P_{\text{end}} = 171 \cdot \text{lbf} \quad \text{Total weight on aft end of basket}$$

$$P_{\text{ult}} := P_{\text{end}} \cdot n_{\text{man_ult}}$$

$$P_{\text{ult}} = 897 \cdot \text{lbf} \quad \text{Ultimate load due to basket installation on aft beam (2/3 cargo)}$$

5.2 Drag Load

$$l_{\text{basket}} := 75.75 \cdot \text{in}$$

Length of basket.

$$w_{\text{basket}} := 22 \cdot \text{in}$$

Width of basket.

$$h_{\text{basket}} := 16 \cdot \text{in}$$

Height of basket.

$$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$$

$$A_f = 352 \cdot \text{in}^2$$

Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$$A_p = 1666 \cdot \text{in}^2$$

Planar Area of basket.

$$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$$

Fineness ratio of basket

$$C_{Do} := 1.6$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 140 \cdot \text{knots}$$

Never-Exceed-Speed of Bell 407.
(Ref. Bell 407 Flight Manual.)

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 156 \cdot \text{knots}$$

Design Dive Speed of Bell 407

$$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$$

$$\text{Drag} = 321 \cdot \text{lbf}$$

Drag on basket.

$$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$$

$$P_{\text{drag_ult}} = 553 \cdot \text{lbf}$$

Ultimate applied Drag load on basket.

$$P_{\text{drag_test}} := \text{Drag} \cdot n_{sf}$$

$$P_{\text{drag_test}} = 481 \cdot \text{lbf}$$

Ultimate Drag load on basket in Static Test.

$$AC_{\text{drag}} := 38.5 \cdot \text{in}$$

Lateral Aerodynamic Center of basket.

$$P_{\text{drag_test_beam}} := \frac{\text{Drag} \cdot n_{sf}}{2}$$

$$P_{\text{drag_test_beam}} = 240 \cdot \text{lbf}$$

Ultimate Drag load on beam in Static Test.

6.0 STRUCTURAL COMPLIANCE

6.1 Beams

Strength of the beams and the attachment of equipment to the beams is demonstrated by test. As stated previously, the aft beam is critical.

6.1.1 Test Setup

A landing gear attachment block was fabricated in accordance with drawing 60620. A scrap Bell 407 aft landing gear fitting was used for the test with the block installed as shown on drawing 60602. The landing gear fitting was then attached to a heavy steel channel to support the beam, as it would be installed on the helicopter. The fitting closest to the basket is critical.

The assembly was installed on a large I beam, with the aft beam extending off the end. The channel section with the landing gear fitting was welded near the end of the I beam. A channel was welded to the I beam to secure the other support beam attachment with a 3/8 bolt.

6.1.2 Test 1

An aft beam was fabricated in accordance with drawing 49221. Material is 2 x 1 x 0.125 wall steel, per CSA G40.21 50W.

A steel plate weighing more than 50 lb. was clamped to the beam. Plywood was clamped to the steel plate. A steel channel section was clamped to the end of the plywood to stabilize the stack of lead shot (25 lb). Twenty seven bags of lead shot, each weighing 25 lb (750 lb. total), were stacked on the plywood (see figure 1).



Figure 1 – Load Test (750 lb. Down)

After 750 lb. was applied down, the drag load was applied. Prior to reaching 240 lb. the beam failed at the "dog-leg".



Figure 2 – Beam Failure

The failure was due to two factors:

1. The dog-leg being located inboard at the highest bending moment.
2. The drag load is applied too far outboard because the basket will hold the end of the beam in plane.

6.1.3 Test 2

The design of the beam was revised to move the dog-leg as far outboard as possible. The drag load is applied inboard at the point of inflection between the basket attachment and the helicopter attachment.

The test was setup and proceeded as before. Drag of 250 lb. was applied after the down load was in place (see figure 3).

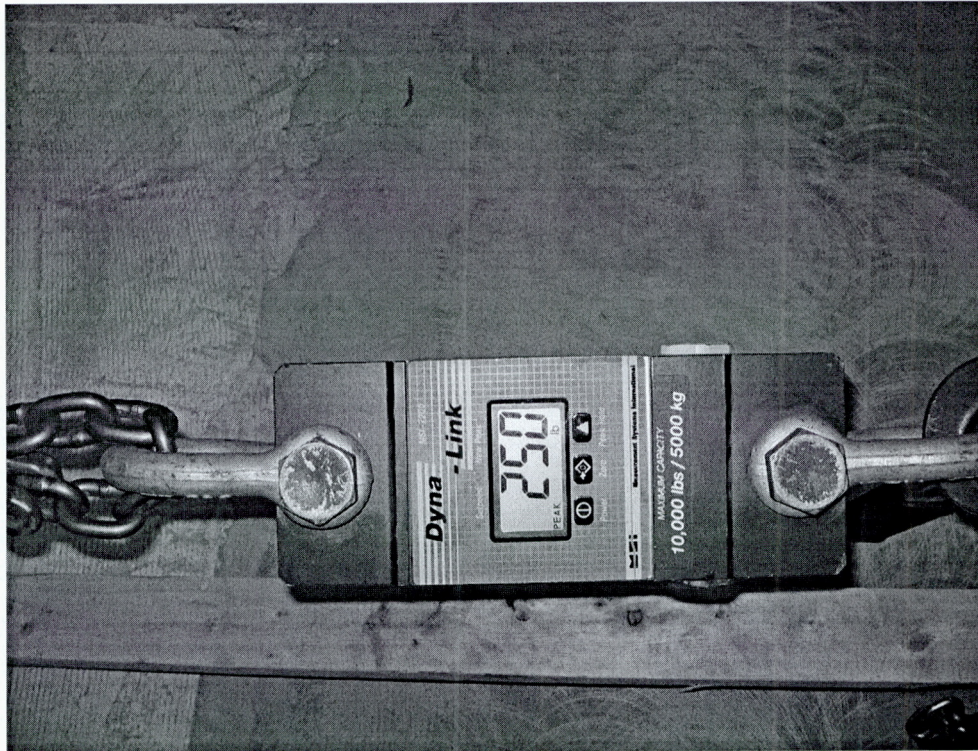


Figure 3 – Drag Load

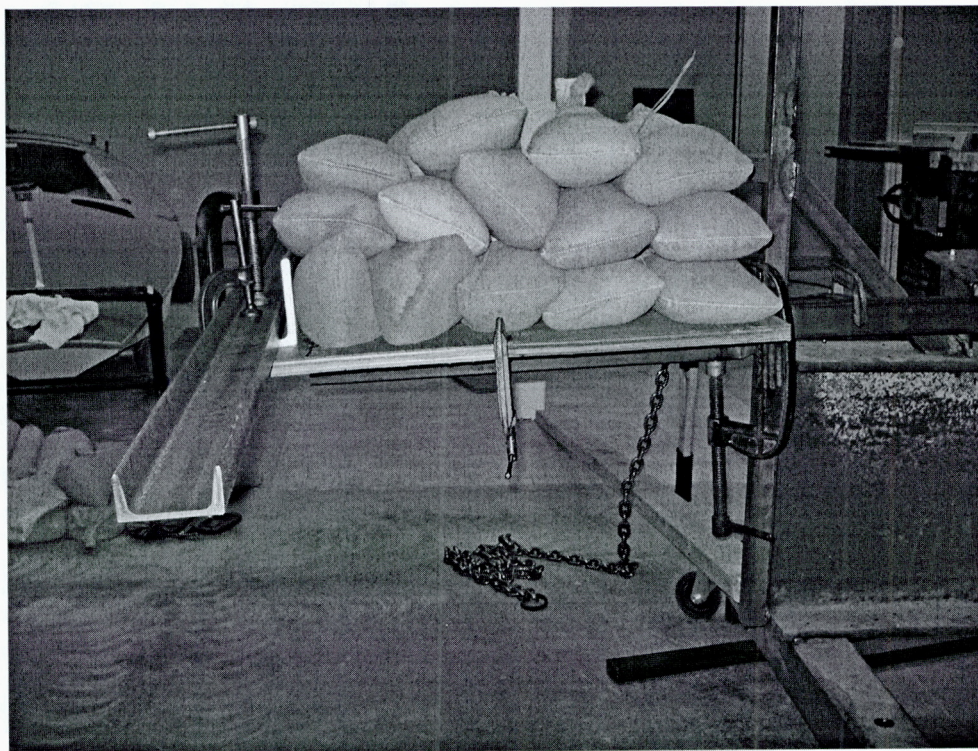


Figure 4 – Load Test (750 lb. Down)

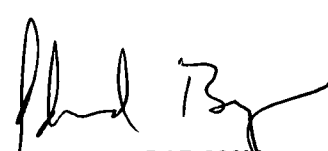
At 750 lb. there was no failure, so the test continued by loading more lead shot. Seven more bags were added for a total of 925 lb.



Figure 5 – Load Test (925 lb. Down)

The channel section was used for stabilizing the stack only. The load was applied for more than 3 seconds. The beam did not fail. The steel beams are sufficient for installation of the cargo basket.

FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE492 Initial Issue Date: 21 June, 2002 Revision: 1 Revision Date: 25 May, 2006 Approval No.: SH00-48 Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.	
Aircraft Mfr: Bell Aircraft Model: 206L Series Registration:		Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	
LIST OF APPROVED REPORTS AND DATA			
Document Number		Document Title	Compliance Status
DCL492-1 DCL492 49222 ER492.03 49201	Revision 0 Revision 5 Revision 0 Revision 0 Revision 2	Document Control List and all documents referred to therein Document Control List and all documents referred to therein Support Beams (Steel) Engineering Report (Steel Beams) Cargo Basket Installation	
		DATA APPROVED BY TRANSPORT CANADA	
ICA492.90	Revision 0	Instructions for Continued Airworthiness	
CERTIFICATION			
UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HERBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.			
I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA			
 E. Burgoin, DAR 290M			

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS 49201 FMS492.01 ICA492.90	Cargo Basket Installation Flight Manual Supplement Instructions for Continued Airworthiness	2 1 0
FABRICATION DOCUMENTS DCL492-1	Document Control List for Side-Mounted Cargo Basket Assembly	0
ENGINEERING DOCUMENTS		
APPROVAL:	ORIGINAL DATE: 17 May, 2002 REVISION DATE: 10 May, 2006	AERO DESIGN LTD. 2013 – 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	DCL492	Rev. 5

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	1
49207	Cargo Basket Lid	1
49208	Cargo Basket Body	1
49209	End Hoop Assembly	1
49210	Basket Components – Hoops	1
49211	Basket Components – Rim	1
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	1
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	1
49218	Placard	1
49221	Support Beams	1
49222	Support Beams (Steel)	0
36255	Handle Assembly	1
36261	Handle Bar Assembly	1
36262	Handle Bracket Assembly	1
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	1
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	1
36280, Sheet 1	Brace	2
36280, Sheet 2	Brace	2
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
ER492.03	Engineering Report – Steel Beams	0
APPROVAL:	ORIGINAL DATE: 4 May, 2006 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave. NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	Side-Mounted Cargo Basket Assembly
	DCL492-1	Rev. 0



Department of Transport

*Supplemental Type Certificate***This approval is issued to:**

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, ALBERTA
T2E 7G9 CANADA

Number: SH00-48**Issue No.:** 2**Approval Date:** December 8, 2000**Issue Date:** June 27, 2002**Responsible Office:**

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L 1, 206L 3, 206L 4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of an Aero Design Ltd right hand cargo
basket/external attachment provisions.

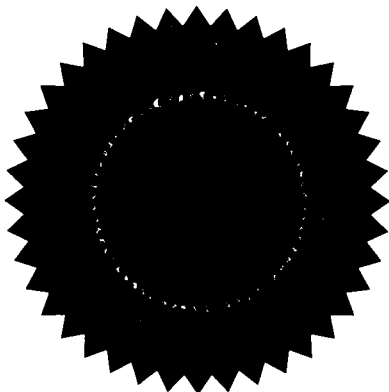
**Installation/Operating Data,
Required Equipment and Limitations:****Bell 407 only:**

Installation of Aero Design Ltd starboard cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 362, Rev. 2, dated 23 November 2000, or later approved revision.

Transport Canada approved Aero Design Ltd, Flight Manual Supplement FMS 362.01 Revision 1, dated 14 November 2000 is required with this installation.

(see continuation sheet)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



D.S. Austen
For Minister of Transport

TRANSFER ENDORSEMENT

A transfer of ownership requires prior approval from the Minister.

The reissue of the certificate in the name of the transferee will be contingent upon a demonstration made by the new owner that he/she can fulfill the responsibilities of the holder as described in Airworthiness Manual Chapter 513.

TRANSFER OF OWNERSHIP

TO (NAME AND ADDRESS OF TRANSFEREE)

ISSUE 3 → JOB 606

JUNE 2004

UPDATES 206L DWG'S

AND ADDS 4107

BASKET MATCHING 206L

FROM (NAME AND ADDRESS OF OWNER)

TRANSFER PARTICULARS (LICENSE
AGREEMENT, SALE OF RIGHTS, ETC.)

DATE OF TRANSFER

SIGNATURE (OF TRANSFERRING OWNER)

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only (continued)

Aero Design Ltd Maintenance Manual Supplement MMS 362.01, Revision 0, dated 15 November 2000 is required with this installation.

Applicable placard required on the basket lid in accordance with installation drawing 36201.

Bell 206L, L-1, L-3, L-4, only:

Configuration A - External Attachment Provisions only:

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 493, Rev. 2, dated 25 June 2002 or later approved revision.

Transport Canada approved Aero Design Ltd, Flight Manual Supplement FMS493.01, dated 19 May 2002, is required with this installation.

Configuration B - Starboard Cargo Basket installation:

Installation of configuration A, External Attachment Provisions is a prerequisite for installation of configuration B, starboard Cargo Basket installation. Installation of the cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL492, Rev. 1, dated 25 June 2002, or later approved revision. High skid gear is required with the basket installation. Placard required on basket lid.

Transport Canada approved Aero Design Ltd., Flight Manual Supplement FMS 492.01, Rev 1, dated 25 June 2002 is required with this installation.

The basis of certification for the Bell 206L series is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.


-- END --

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	0
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	0
49207	Cargo Basket Lid	0
49208	Cargo Basket Body	0
49209	End Hoop Assembly	0
49210	Basket Components – Hoops	0
49211	Basket Components – Rim	0
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	0
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	0
49218	Placard	0
49221	Support Beams	0
36255	Handle Assembly	0
36261	Handle Bar Assembly	0
36262	Handle Bracket Assembly	0
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	0
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	0
36280	Brace	0
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
FMS492.01	Flight Manual Supplement	1

APPROVAL: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <div style="display: inline-block; text-align: center;"> Transport Canada </div> <div style="display: inline-block; text-align: center;"> Transports Canada </div> </div> <div style="margin-top: 5px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>D. S. Clouston</i></u> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>2</u> Issue Date <u>02-06-27</u> <small>YY-MM-DD</small> </div>	ORIGINAL DATE: 17 May, 2002 REVISION DATE: 25 June, 2002	AERO DESIGN LTD. 1045 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333
SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation	
<h2 style="margin: 0;">DCL492</h2>		Rev. <h2 style="margin: 0;">1</h2>

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49301	External Attachment Provisions Installation	1
FABRICATION DOCUMENTS		
49311	Forward Fitting	0
49312	Aft Fitting	0
49311	Forward Fitting	1
49312	Aft Fitting	1
49319	Washer	0
49320	Barrel Nut	0
49320	Barrel Nut	1
49321	Spacer	0
ENGINEERING DOCUMENTS		
ER493.01	Engineering Report	0
FMS493.01	Flight Manual Supplement	0
ER493.03	Test Report	0
261.02	Honeycomb Insert Load Test Report	0
<div> <div> APPROVAL:  <div> Transport Canada </div> </div> <div> Transport Canada </div> </div> <div> AIRCRAFT CERTIFICATION DIVISION APPROVED By <i>D. S. Austen</i> Appr'l No. <u>SH00-48</u> Appr'l Date <u>00-12-08</u> Issue No. <u>2</u> Issue Date <u>02-06-27</u> YY - MM - DD </div>		

ORIGINAL DATE:
19 May, 2002
REVISION DATE:
25 June, 2002

AERO DESIGN LTD.
1045 McTavish Rd. NE
Calgary, Alberta
T2E 7G9
Ph. (403) 250-8027
Fax. (403) 250-8333

SHEET 1 OF 1

BELL 206L SERIES
External Attachment Provisions
DCL493

Rev.
2

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 492.01**

External Cargo Basket

Bell 206L Series

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Date: 19 June, 2002

Revision 1, 12 July, 2002

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

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1.0 INTRODUCTION

The Cargo Basket mounts to the side of the helicopter, supported by two beams bolted to the External Attachment Provisions. The provisions are incorporated into landing gear fittings that replace the existing fittings.

2.0 REFERENCE

AC43.13-1B

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube to tube welds and mesh to tube welds every 100 hours for cracks, defects or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours for cracks, defects or other damage.
- Visually inspect bolts attaching the basket to the beams every 100 hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours for security and damage.

3.3 External Attachment Provisions

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Basket is fabricated from the following materials:

Lid and Rim:	3/4" x 0.035" square 4130 steel tube
Frames:	1/2" x 0.035" square 4130 steel tube
Mesh:	3/4" 18 ga. (0.040") expanded carbon steel mesh

Repair in accordance with AC43.13-1B, Chapter 4, as required.

4.2 Beams

DO NOT REPAIR MAJOR DAMAGE TO BEAMS. Replace beam if major damage is found.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing

4.3 Landing Gear Attachment Fittings

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS. Replace External Attachment Fittings if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 493.01**

External Attachment Provisions

Bell 206L Series

Approved: E. Burgoin, P. Eng.

Prepared by: S. Fahey

Date: 12 July, 2002
Revision 0

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

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1.0 INTRODUCTION

Provisions for attaching external equipment to the helicopter are incorporated into fittings that replace the existing fittings which mount the helicopter on the landing gear cross tubes.

2.0 REFERENCE

AC43.13-1B

3.0 INSPECTION PROCEDURES

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS. Replace External Attachment Fittings if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.



Transport
Canada

Transports
Canada

Your file Votre référence

Our file Notre référence

Aircraft Certification
Prairie and Northern Region
1100-9700 Jasper Avenue
Edmonton, Alberta
T2E 6Z8

**File: C-02-0218 (RAED)
SH00-48**

June 28, 2002

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, Alberta
T2E 7G9 CANADA

Dear Sirs:

**RE: REVISION TO SUPPLEMENTAL TYPE CERTIFICATE NO. SH00-48 - ISSUE 2 DATED
JUNE 27, 2002 - INSTALLATION OF AN AERO DESIGN LTD RIGHT HAND CARGO
BASKET/EXTERNAL ATTACHMENT PROVISIONS
BELL 206L, 206L-1, 206L-3, 206L-4, BELL 407
ISSUED TO AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this STC in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25.

The requirements of AWM 561 apply where parts are manufactured and offered for sale. The provisions of CAR 571.06(4) should also be consulted.

A Canadian holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Subpart 91.

Yours truly,

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: (780) 495-5227
Facs: (780) 495-7963

Encl.

cc: RACH Calgary

Canada

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD493, Rev. 0

1. NAME AND ADDRESS OF APPLICANT:

AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, AB, T2E 7G0

2. IDENTIFICATION OF PRODUCT

MAKE:

Bell Helicopter

MODEL:

206L, 206L-1,
206L-3, 206L-4

ALL CORRESPONDANCE TO:
AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, AB, T2E 7G0

SERIAL No.:

REGISTRATION:

3. REQUEST FOR:

- A. SUPPLEMENTAL TYPE CERTIFICATE (STC) ☐
- B. STC/STA REVISION ☒ STC/STA No. SH00-48
- C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC) ☐
- D. LIMITED STC/STA REVISION ☐ LSTC/LSTA No.
- E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE ☐
- F. F.A.A. STC REVISION ☐ STC No.
- G. FAMILIARIZATION OF F.A.A. STC ☐ STC No.
- H. REPAIR DESIGN APPROVAL (RDC) ☐
- I. PARTS DESIGN APPROVAL (PDA) ☐

4. TITLE OF MODIFICATION OR REPAIR:

Installation of External Attachment Provisions

5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:

Provisions for mounting external cargo basket are installed on helicopter.

6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:

A. TA NO. H-92

B. TC No.

C. OTHER

7. PROPOSED BASIS OF APPROVAL:

- A. SAME AS TA ☒ B. SAME AS TC ☐ C. OTHER ☐ (Please specify)

DOCUMENTATION CHECKLIST	REQUIRED		FOR DOT USE ONLY		
	YES	NO	RECEIVED		DATE
			YES	NO	
COMPLIANCE PROGRAM	X		✓		2002
MASTER DRAWING LIST	X		✓		2002
FLIGHT MANUAL SUPPLEMENT		X	✓		2002
MAINTENANCE MANUAL SUPPLEMENT	X	✓		✓	
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X		✓	
ENGINEERING REPORTS	X		✓		
DESIGN DRAWINGS		X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X		✓		
ELECTRICAL LOAD ANALYSIS		X			
DRAFT STC, LSTC OR RDA		X			
WEIGHT AND MOMENT CHANGE		X			
FLIGHT TEST DATA		X	✓		
OTHER (Specify)			✓		

9. APPLICANT'S REMARKS:

10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

PER: S. T. Attie

SIGNATURE OF APPLICANT

FOR E. BURGAIN

Consultant

TITLE

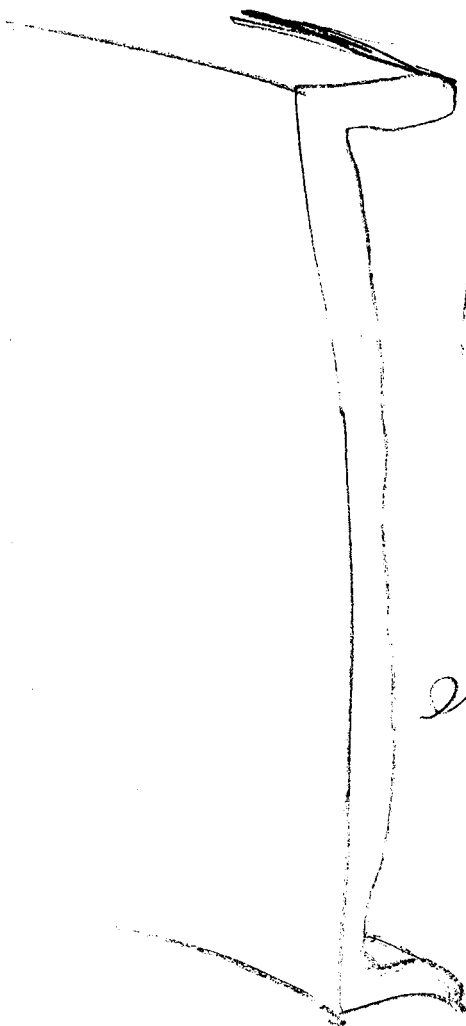
12 March, 2002

DATE

11.

SIGNATURE OF REGIONAL ENGINEER

DATE



Robert [redacted] Grayline
312 375 8071

TASHMAN

VIC

on mail

RJ SATZ

@Yahoo.com

Robert SATZ

P.O.

BIRD STEPHENSON
807 548 5647

Forest Helicopters

for heli @ voyagers.ca

[AS 350
L3 Basket

FORHELI@VOYAGEUR.CA

From :

PHONE No. : 00

May. 09 2002 11:02AM P01

272

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE: May 9, 2002 TIME: 10:58 AM
TO: M&M Aerospace H/W PHONE: 310-900-1300
Pamela Horton FAX: 310-900-1319
FROM: S. Fahey PHONE: 403-250-8027
Aero Design Ltd. FAX: 403-250-8333

Number of pages including cover sheet: 1

RE: PRICE QUOTE

I would like a quote on the following items, noting which are in stock and which are not:

Barrel Nuts (w. retainer):

<u>MFR.</u>	<u>P/N</u>	<u>QTY</u>	
SPS	114LH7456T-064	25	X
SPS	2452-064	25	X
SPS	2552-064	25	X
SPS	2752-064	25	40 ⁰⁰ ea stk
SPS	42FBN-824	25	X
SPS	59764B-624A	25	X
SPS	B12670-8	25	X
SPS	1F8BF577-6	25	X
SPS	RMLH2577-064	25	X

Regards,

Pamela Horton
M & M AEROSPACE
DATE: 5/9/02
Fax: 310-900-1319
Ph: 310-900-1315

QUOTE#: 499419**M & M Aerospace Hardware, Inc.**

PRT DATE: 04/08/02
TO: 000272
AERO DESIGN LTD
1055 MC TAVISH RD NE
CALGARY, AB
CANADA T2E 7G9

*** QUOTATION ***

PAGE: 3

FROM:
M & M Aerospace Hardware, Inc.
2374 Pacifica Place
Rancho Dominguez, CA 90220-6214
Tel: 310-900-1300
Fax: 310-900-1319

QUOTE DATE: 04/08/02
EXPIRES : 05/08/02
QUOTED BY : Pamela Horton

QUOTE# : FAX
CONTACT: STEVEN
PHONE# :
FAX# :

ITM	QTY	PART NUMBER	PRICE	UM	DELIVERY INFO
017	100	NAS1149D0463J	0.20000	EA	
	200		0.10000	EA	
	COMMENT: STK				
018	100	NAS1149D0516J	0.20000	EA	
	200		0.10000	EA	
	COMMENT: STK				
019	25	2752-064	40.00000	EA	
	COMMENT: STK				
020	25	2752-054	53.00000	EA	
	COMMENT: STK				
021	25	2752-048	30.00000	EA	
	COMMENT: STK				

ALL ORDERS SUBJECT TO 100% RESTOCKING CHARGE

QUOTES VALID FOR 30 DAYS

ALL STOCK SUBJECT TO PRIOR SALE

M & M AEROSPACE IS AN AUTHORIZED HI-SHEAR DISTRIBUTOR.

M&M IS ISO 9002 REGISTERED.

01/31/2004 08:35

1-807-548-8362

FOREST HELICOPTERS 2003

RR 1, Anderson Road, Kenora, ON
P9N 3W7
Ph: 807-548-5647
Fax: 807-548-8362

GST Registration #:

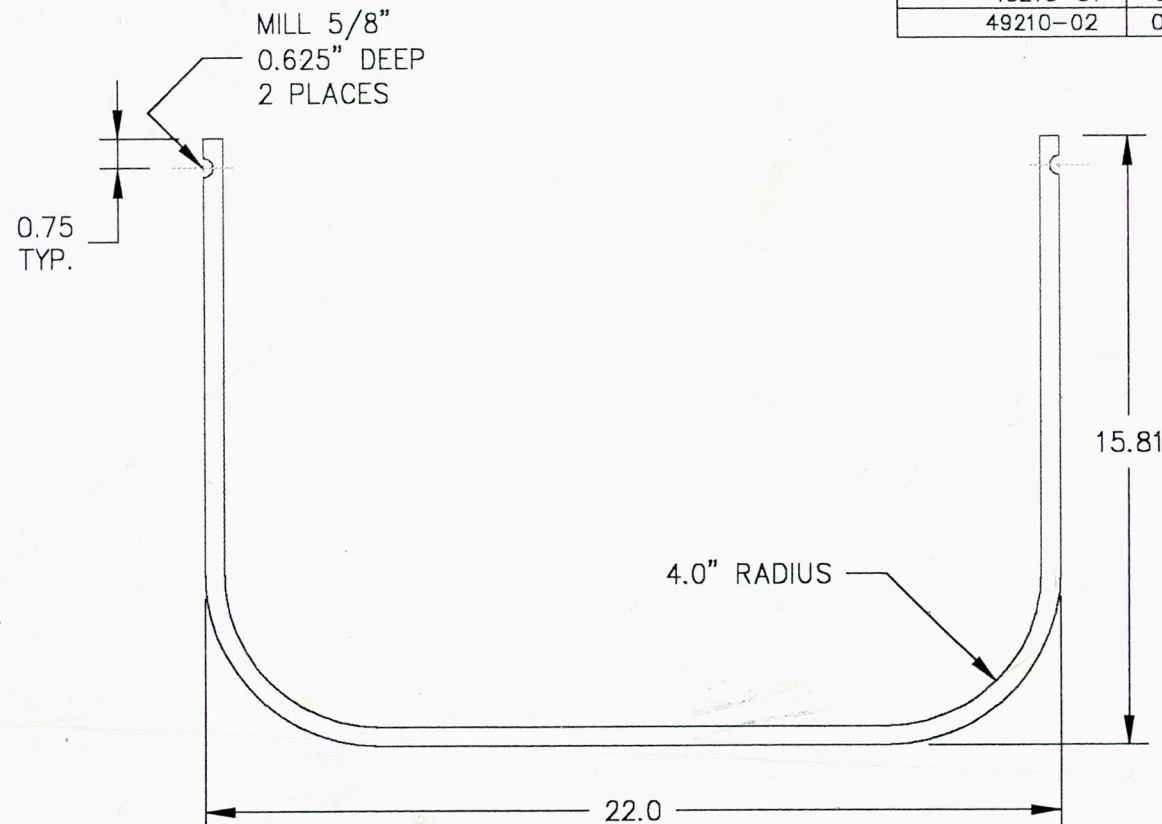
Aero Design Ltd.
1055 McTavish Road, N
Calgary, Alberta T2E

FOREST HELICOPTERS

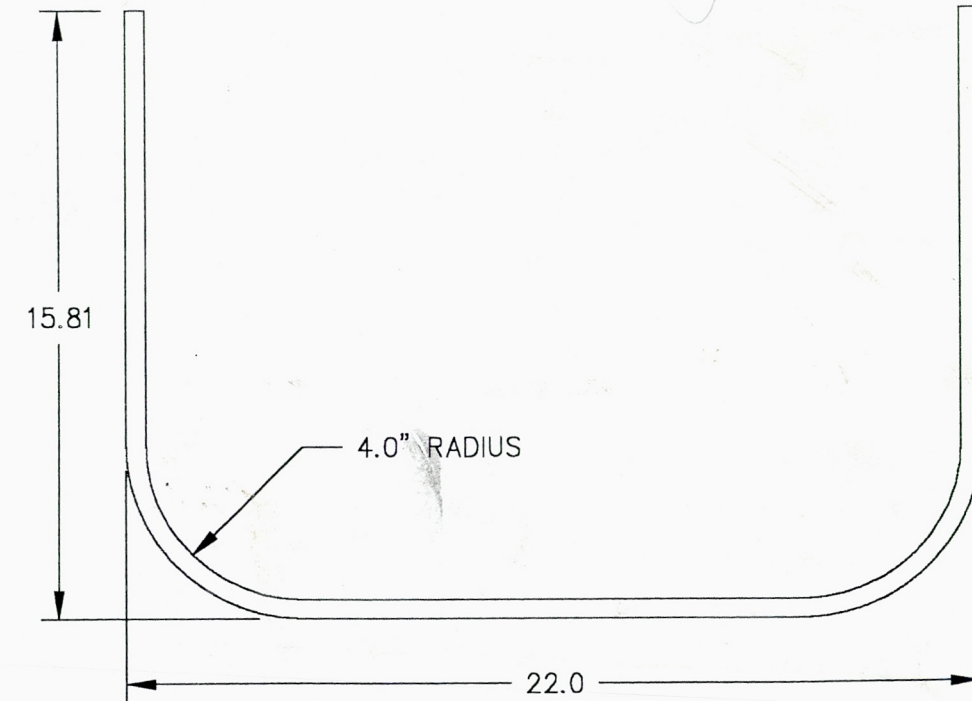
JUNE 23/03

LIST OF MATERIALS

PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49210-01	01	END HOOP	4130 SQUARE TUBING	MIL-T-6736	Ø1/2" x 0.035 WALL
49210-02	02	HOOP	4130 SQUARE TUBING	MIL-T-6736	Ø1/2" x 0.035 WALL



(01) END HOOP



(02) HOOP

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.
2. DRILL 3/32" VENT HOLE IN BOTTOM OF HOOPS FOR VENTING WELD GASES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

AERO DESIGN LTD.

ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL 206L
SIDE-MOUNTED CARGO BASKET
BASKET COMPONENTS - HOOPS

SCALE 1 : 5

DWG. SIZE
LGL

DWG. NO.

49210

REV.

0

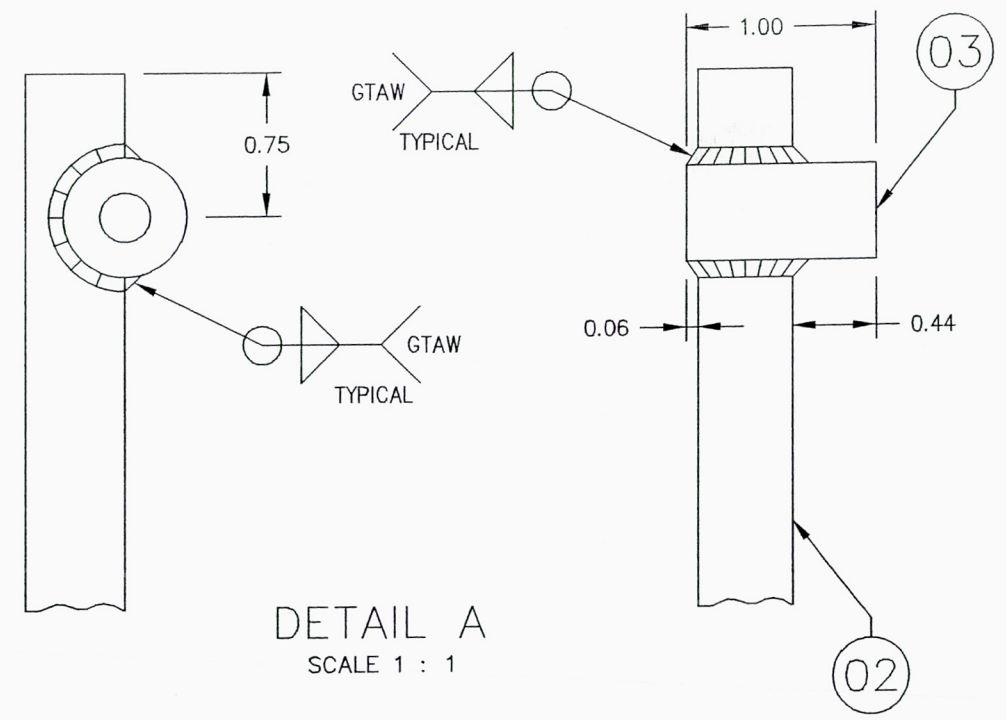
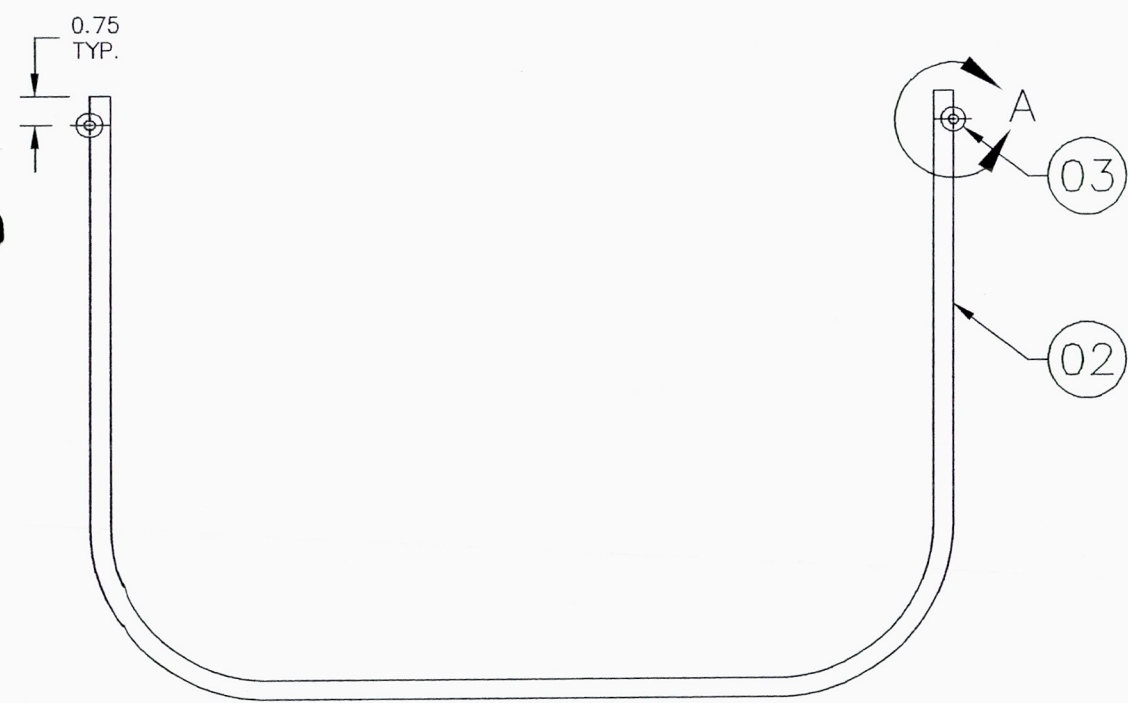
SHEET 1 OF 1

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JUNE 23/03

LIST OF MATERIALS						
QTY.	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
2	49217-01	03	LUG			
1	49210-01	02	HOOP			
	49209-01	01	END HOOP ASSEMBLY			



NOTES:
1. WELDING OF 4130 STEEL TO BE COMPLETED BY GTAW METHOD TO AMS 2685C.
WELDING ROD SHALL CONFORM TO AMS 6457A OR LATER REVISION.

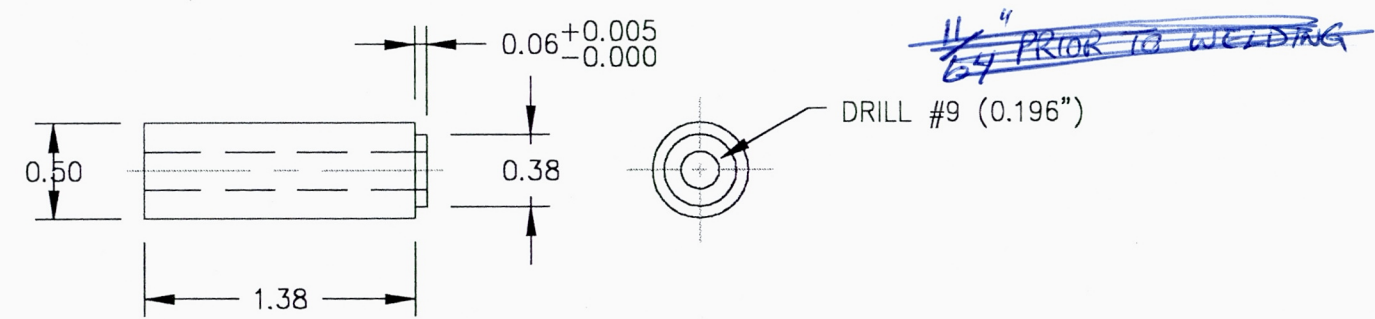
01 END HOOP ASSEMBLY

APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 – 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 aerodesign@telusplanet.net</div>					
DRAWN: STEVEN FAHEY		MAY 10/02							
CHECKED: E. BURGOIN		MAY 10/02							
<div>UNLESS OTHERWISE SPECIFIED</div> <div>DIMENSIONS ARE IN INCHES.</div> <div>TOLERANCES ON:</div> <div>DECIMALS ANGLES</div> <div>X.XXX ±0.010 ±1/2°</div> <div>X.XX ±0.03</div> <div>X.X ±0.1</div>				BELL 206L					
				SIDE-MOUNTED CARGO BASKET					
				END HOOP ASSEMBLY					
				SCALE 1 : 5		DWG. SIZE		DWG. NO.	
				SHEET 1 OF 1		LGL		49209	
				REV.		CHG.			
				0		A			

1	DESCRIPTION OF CHANGE	INITIALS	DATE
REV.			
NOTICE THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.			

JUNE 23/03

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49215-01	01	SPACER	MILD STEEL	AISI 1010/1020	Ø1/2" OD BAR



01 SPACER

NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGAIN	MAY 10/02
STRESS:	

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
1			

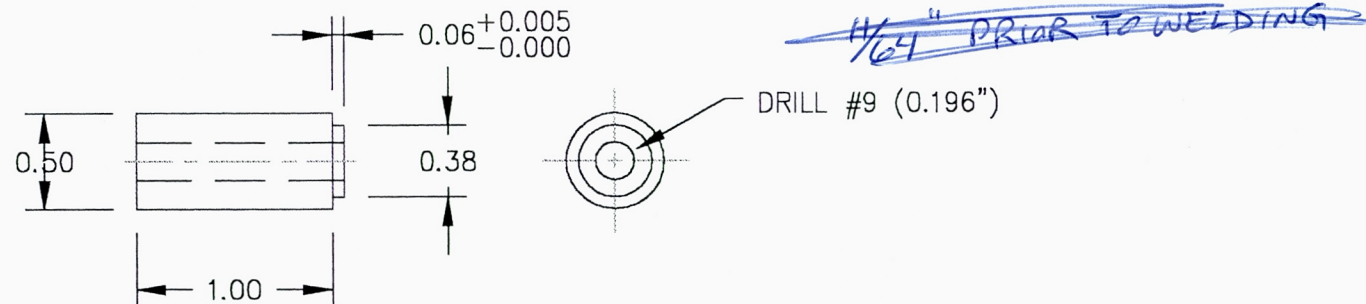
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

BELL 206L SIDE-MOUNTED CARGO BASKET BASKET COMPONENTS - SPACER			
SCALE 1 : 1	DWG. SIZE LGL	DWG. NO. 49215	REV. 0
SHEET 1 OF 1			

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JUNE 23/03

LIST OF MATERIALS					
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49216-01	01	SPACER	MILD STEEL	AISI 1010/1020	Ø1/2" OD BAR



01 SPACER

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

AERO DESIGN LTD.
ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL 206L
SIDE-MOUNTED CARGO BASKET
BASKET COMPONENTS - SPACER

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
1			

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

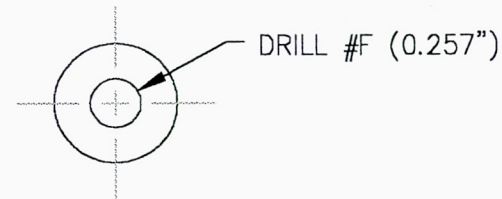
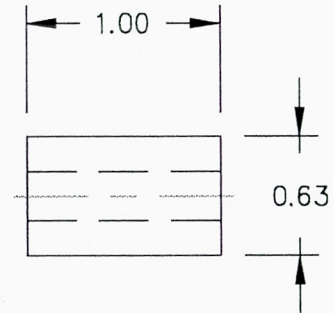
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	LGL	49216	0

JUNE 23/03

LIST OF MATERIALS

PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
49217-01	01	LUG	MILD STEEL	AISI 1010/1020	Ø5/8 OD BAR



01 LUG

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 10/02
CHECKED: E. BURGOIN	MAY 10/02
STRESS:	

AERO DESIGN LTD.

ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL 206L
SIDE-MOUNTED CARGO BASKET
BASKET COMPONENTS - LUG

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
------	-----------------------	----------	------

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

SCALE 1 : 1

DWG. SIZE
LGL

DWG. NO.
49217

REV.
0

SHEET 1 OF 1

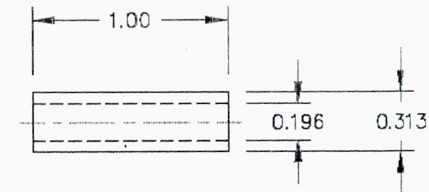
JUNE 23/03

LIST OF MATERIALS

PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36275-01	01	BUSHING	AISI 304 STAINLESS		5/16" X 0.065" TUBE

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.



(01) BUSHING

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 17/02
CHECKED: E. BURGAIN	MAY 17/02
STRESS:	

AERO DESIGN LTD.

ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

DECIMALS ANGLES
X.XXX ± 0.010 $\pm 1/2^\circ$
X.XX ± 0.03
X.X ± 0.1

HELICOPTER CARGO BASKET
BUSHING

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
------	-----------------------	----------	------

NOTICE

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SCALE 1 : 1

DWG. SIZE
LGL

DWG. NO.

36275

REV.

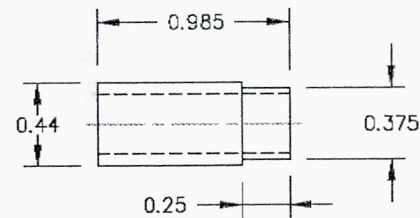
0

SHEET 1 OF 1

JUNE 23/03

LIST OF MATERIALS

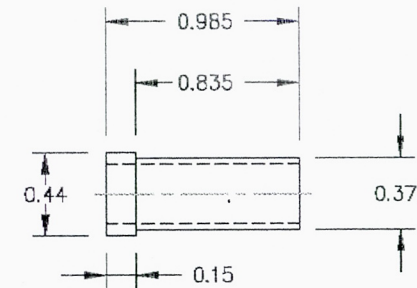
PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36274-01	01	BUSHING	AISI 304 STAINLESS		7/16" X 0.065" TUBE



01 BUSHING
ALTERNATE PART

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.



01 BUSHING

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 17/02
CHECKED: E. BURGOIN	MAY 17/02
STRESS:	

AERO DESIGN LTD.

ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9

BELL HELICOPTER
CARGO BASKET
BUSHING

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
1			

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

SCALE 1 : 1

SHEET 1 OF 1

DWG. SIZE
LGL

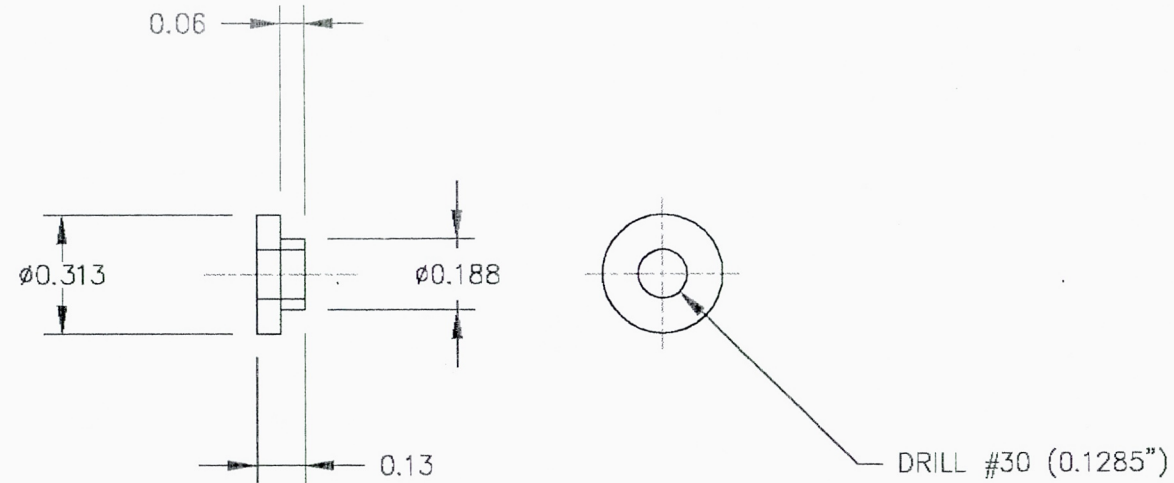
DWG. NO.
36274

REV.
0

JUNE 23/03

LIST OF MATERIALS

PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE
36276-01	01	SPRING HOOK	6061 ALUMINUM		5/16" ROD



01 SPRING HOOK

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.

APPROVALS	DATE
DRAWN: STEVEN FAHEY	MAY 17/02
CHECKED: E. BURGAIN	MAY 17/02
STRESS:	

AERO DESIGN LTD.

ENGINEERING CONSULTANTS
1045 McTAVISH ROAD N.E.
CALGARY, ALBERTA T2E 7G9HELICOPTER CARGO BASKET
SPRING HOOK

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
------	-----------------------	----------	------

NOTICE

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

SCALE 2 : 1

DWG. SIZE
LGL

DWG. NO.

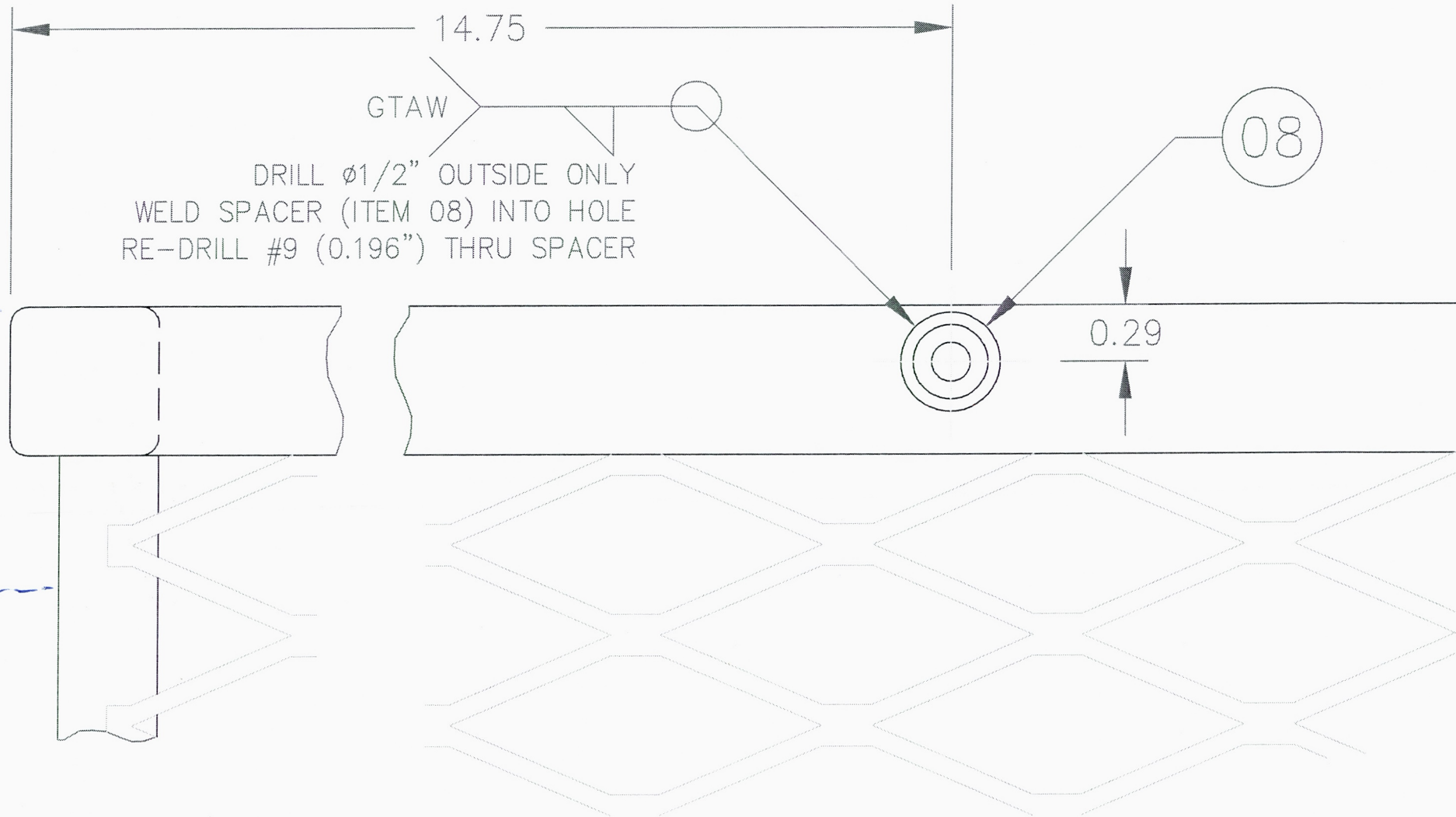
36276

REV.

0

SHEET 1 OF 1

BODY



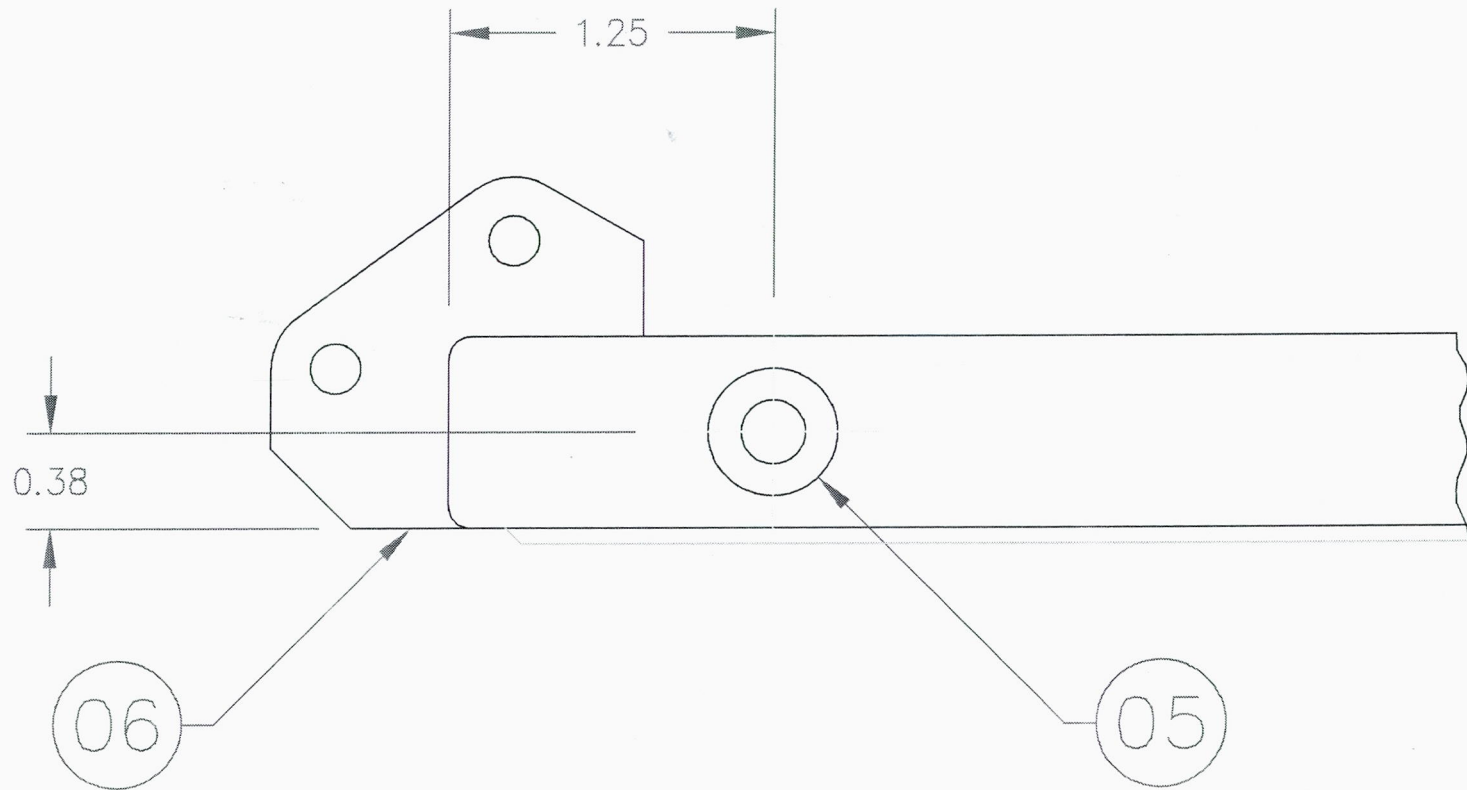
DETAIL C

SCALE 1:1

VIEW LOOKING AT FRONT RIM OF BAKSET

3

LID



DETAIL C

SCALE 1 : 1

ENDS ARE A BIT DIFFERENT

$$16\frac{1}{4} = 15\frac{5}{4}$$

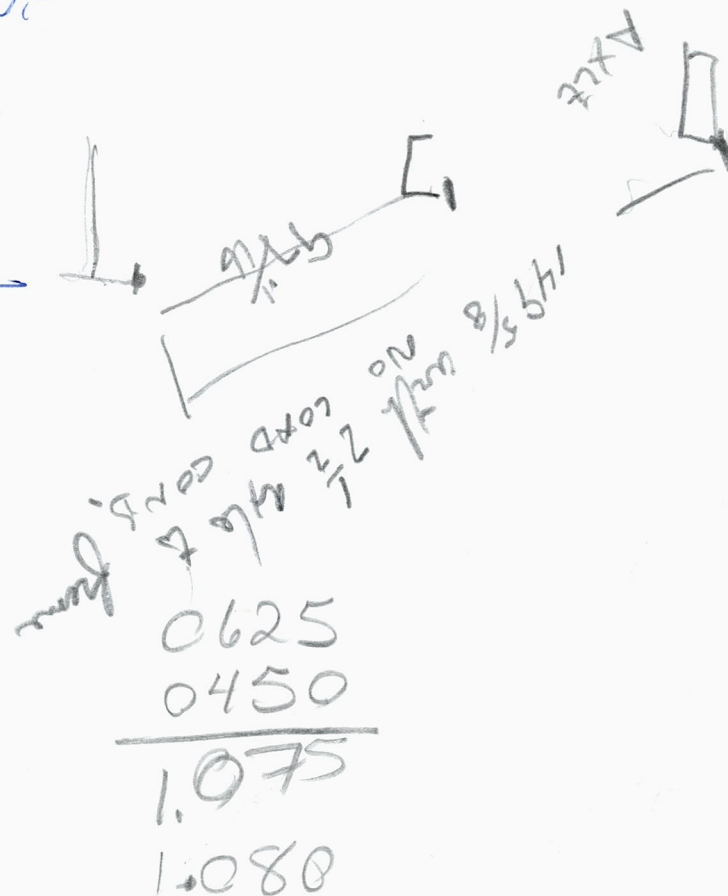
$$- \frac{3}{4}$$

INSIDE $\rightarrow 15\frac{1}{2}$

$$16\frac{5}{16} = 15\frac{21}{16}$$

$$- \frac{12}{16}$$

$\rightarrow 15\frac{9}{16}$



AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

11 June, 2003

Hélicraft 2000 Inc.
6500, Chemin de la Savane
St-Hubert, Québec
J3Y 5K2

Attn: Daniel Hauver

Re: Approval documents for Cargo Basket

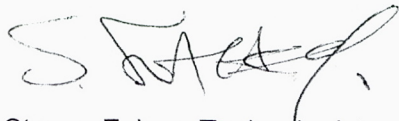
Daniel,

I have enclosed the following approval documents supporting the installation of the Cargo Basket.

Supplemental Type Certificate	SH00-48	Issue 2
Document Control List	DCL493	Revision 2
Document Control List	DCL492	Revision 1
Flight Sanual Supplement	FMS493.01	Revision 0
Flight Sanual Supplement	FMS492.01	Revision 1
Installation Drawing	49301	Revision 1
Installation Drawing	49201	Revision 0

I appologize for omitting these documents from the original shipment.

Regards,



Steven Fahey, Technologist



JUST TELL US WHERE AND WHEN

AFFIX



PRO NO.
792-237670

HERE

STRAIGHT BILL OF LADING - NOT NEGOTIABLE

DATE

May 9

SHIPPER'S NUMBER

BILL OF LADING NUMBER

PURCHASE ORDER NUMBER

SHIPPER ACCOUNT NUMBER

CONSIGNEE ACCOUNT NUMBER

SHIPPER (FROM)

AERO DESIGN LTD

CONSIGNEE (TO)

WISK-AIR HELICOPTERS

STREET

2013-39 AVE N.E

STREET

DRYDEN, ONTARIO

CITY/PROVINCE

CALGARY

POSTAL CODE

CITY/PROVINCE

HOLD FOR PICK-UP

POSTAL CODE

FAX NUMBER

403-250-8027

FAX NUMBER

PHONE GREG HEURING

SPECIAL INSTRUCTIONS

ROUTING

807-737-4111
807-737-4119

473-5485

SPECIAL SERVICES:

(Additional charges will apply)

Refer to Canadian Freightways Guaranteed Service Sheets for service availability from your area.

CF Quote Number:

If a special service is not selected, this shipment will move according to Canadian Freightways regular service standards.

Guaranteed Time Definite Delivery Service:

before 10:30 am ☐
before 9:00 am ☐
before 7:00 am ☐

CF DaySaver

☐

CF Prime Time:

☐

CF Prime Time Plus:

☐

Enter quote number in space above.

Quote number required prior to shipping. Please call the CF Business Centre 1-800-561-5555.

Canadian Freightways Air:

☐ Overnight ☐ Second Day ☐ Third Day

CF 100

Enter quote number in space above

PIECES	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	DANGEROUS GOODS			WEIGHT(LBS)	RATE	FREIGHT CHARGES SHIPPER TO CHECK
		CLASS	P.I.N.	PKG. GRP.			
1	CPRGO BASKET				80		<input type="checkbox"/> PREPAID <input checked="" type="checkbox"/> COLLECT
							If not indicated, shipment will automatically move collect.
							C.O.D.
							AMOUNT
							\$
							C.O.D. FEE
							<input type="checkbox"/> PREPAID
							<input type="checkbox"/> COLLECT

EMERGENCY RESPONSE TELEPHONE NO.

TYPE OF PLACARD

QUANTITY

EMERGENCY RESPONSE PLAN NO.

DECLARED VALUATION:

Maximum liability of carrier is \$2.00 per lb. (\$4.41 per kilogram) unless declared valuation states otherwise. On shipments moving within Canada an excess valuation charge of 1% will be assessed on valuation in excess of \$10.00 per pound. On shipments moving from Canada to the U.S. an excess valuation charge of 1% will be assessed on valuation in excess of \$2.00 per pound.

\$

DIMENSIONS

6' x 2' x 2' FT

TOTAL CUBIC FEET

NOTICE OF CLAIM: (a) No carrier is liable for loss, damage or delay to any goods under the Bill of Lading unless notice thereof setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the originating carrier or the delivering carrier within sixty (60) days after the delivery of the goods, or, in the case of failure to make delivery, within nine (9) months from the date of shipment. (b) The final statement of the claim must be filed within nine (9) months from the date of shipment together with a copy of the paid freight bill.

RECEIVED at the point of origin on the date specified, from the consignor mentioned herein, the property herein described, in apparent good order, except as noted (contents and conditions of contents of package unknown) marked, consigned and destined as indicated below, which the carrier agrees to carry and to deliver to the consignee at the said

destination, if on its own authorized route or otherwise to cause to be carried by another carrier on the route to said destination, subject to the rates and classification in effect on the date of shipment.

It is mutually agreed, as to each carrier of all or any of the goods over all or any portion of the route to destination, and as to each party of any time interested in all or any of the goods, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, including conditions set aside by the standard bill of lading, in power at the date of issuing, which are hereby agreed by the consignor and accepted for himself and his assigns.

The Contract for the carriage of the goods listed in the bill of lading is governed by regulation in force in the jurisdiction at the time and place of shipment and is subject to the conditions set out in such regulations.

PER	AERO DESIGN LTD	PER	B. Beaulieu	UNIT NUMBER	085	DATE	May 9
SHIPPER	Phil By	CARRIER	CANADIAN FREIGHTWAYS			TIME	1:30

For shipment tracking visit: www.canadianfreightways.com

0001 (02-01)

NUMBER OF PIECES RECEIVED ▲

DOCK COPY

PACKING SLIP

9 May, 2003

Address:

Wisk-Air Helicopters
520 Orville Weiben Cr.
Thunder Bay, Ontario
P7E 6M9

(807) 475-4510

Attention:

Greg Heuring (807) 937-4111

Reference: Your Purchase Order 1166:

Quantity Ordered	Quantity Shipped	Description	Part Number
✓ 1	1	200 Lb Cargo Basket Assembly	49205-01
✓ 1	1	Forward Support Beam	49221-01
✓ 1	1	Aft Support Beam	49221-02
✓ 2	2	Forward External Attachment Fitting	49311-01
✓ 2	2	Aft External Attachment Fitting	49312-01
✓ 4	4	Barrel Nut	49320-01
✓ 5	5	Bolt	AN4-24A
✓ 10	10	Washer	AN960JD416
✓ 5	5	Nut	MS21044N4
✓ 4	4	Bolt	AN6-17A
✓ 4	4	Washer	AN960JD616
✓ 1	1	Installation Drawing – Cargo Basket	49201
✓ 1	1	Installation Drawing – Fittings	49301
✓ 1	1	Maintenance Instructions (copy)	MI 492.01
✓ 1	1	Maintenance Instructions (copy)	MI 493.01
✓ 1	1	Flight Manual Supplement (copy)	FMS 492.01
✓ 1	1	Flight Manual Supplement (copy)	FMS 493.01
✓ 1	1	Document Control List (copy)	DCL 492
✓ 1	1	Document Control List (copy)	DCL 493
✓ 1	1	Supplemental Type Certificate (copy)	SH00-48
✓ 1	1	Lid Brace Ass'y	36280
✓ 1	1	Bolt	AN3-15A
✓ 1	1	Bolt	AN3-17A
✓ 2	2	Washer	AN970-3
✓ 4	4	Washer	AN960-10
✓ 2	2	Nut	MS21044N3
✓ 1	1	Lid Brace Installation Drawing	49205-04



AFFIX CFI PRO LABEL HERE

JUST TELL US WHERE AND WHEN

STRAIGHT BILL OF LADING - NOT NEGOTIABLE

CF
PRO NO.
954-362474

DATE

May 8

SHIPPER'S NUMBER		BILL OF LADING NUMBER		PURCHASE ORDER NUMBER	
SHIPPER ACCOUNT NUMBER			CONSIGNEE ACCOUNT NUMBER		
SHIPPER (FROM) AERO DESIGN			CONSIGNEE (TO) WISK-AIR HELICOPTERS		
STREET 2013-39TH AVENUE N.E.			STREET 520 ORVILLE WIEBEN CR.		
CITY/PROVINCE CALGARY, AB.		POSTAL CODE T2E6R7	CITY/PROVINCE THUNDER BAY ON.		POSTAL CODE P7E6M9
FAX NUMBER (403) 250-8333 (PH -8027)			FAX NUMBER (807) 475-4510 (PH)		
SPECIAL INSTRUCTIONS			ROUTING		

SPECIAL SERVICES: Refer to Canadian Freightways Guaranteed Service Sheets for service availability from your area.
(Additional charges will apply) If a special service is not selected, this shipment will move according to Canadian Freightways regular service standards.

CF Quote Number:

Guaranteed Time Definite Delivery Service:

before 10:30 am ☐
before 9:00 am ☐
before 7:00 am ☐

CF DaySaver

CF Prime Time: ☐CF Prime Time Plus: ☐

Enter quote number in space above.
Quote number required prior to
shipping. Please call the CF Business
Centre 1-800-561-5555.

Canadian Freightways Air:

☐ Overnight ☐ Second Day ☐ Third Day

CF 100

Enter quote number in space above

PIECES	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	DANGEROUS GOODS			WEIGHT(LBS)	RATE	FREIGHT CHARGES SHIPPER TO CHECK
		CLASS	P.I.N.	PKG. GRP.			
1	CARGO BASKET				80		<input type="checkbox"/> PREPAID <input checked="" type="checkbox"/> COLLECT
							If not indicated, shipment will automatically move collect.
							C.O.D.
							AMOUNT
							\$
							C.O.D. FEE
							<input type="checkbox"/> PREPAID
							<input type="checkbox"/> COLLECT

EMERGENCY RESPONSE TELEPHONE NO.	TYPE OF PLACARD	QUANTITY	EMERGENCY RESPONSE PLAN NO.	DECLARED VALUATION: Maximum liability of carrier is \$2.00 per lb. (\$4.41 per kilogram) unless declared valuation states otherwise. On shipments moving within Canada an excess valuation charge of 1% will be assessed on valuation in excess of \$10.00 per pound. On shipments moving from Canada to the U.S. an excess valuation charge of 1% will be assessed on valuation in excess of \$2.00 per pound.
DIMENSIONS 6FT x 2FT x 2FT			TOTAL CUBIC FEET 24	\$

NOTICE OF CLAIM: (a) No carrier is liable for loss, damage or delay to any goods under the Bill of Lading unless notice thereof setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the originating carrier or the delivering carrier within sixty (60) days after the delivery of the goods, or, in the case of failure to make delivery, within nine (9) months from the date of shipment. (b) The final statement of the claim must be filed within nine (9) months from the date of shipment together with a copy of the paid freight bill.

RECEIVED at the point of origin on the date specified, from the consignor mentioned herein, the property herein described, in apparent good order, except as noted (contents and conditions of contents of package unknown) marked, consigned and destined as indicated below, which the carrier agrees to carry and to deliver to the consignee at the said

destination, if on its own authorized route or otherwise to cause to be carried by another carrier on the route to said destination, subject to the rates and classification in effect on the date of shipment.

It is mutually agreed, as to each carrier of all or any of the goods over all or any portion of the route to destination, and as to each party of any time interested in all or any of the goods, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, including conditions set aside by the standard bill of lading, in power at the date of issuing, which are hereby agreed by the consignor and accepted for himself and his assigns.

The Contract for the carriage of the goods listed in the bill of lading is governed by regulation in force in the jurisdiction at the time and place of shipment and is subject to the conditions set out in such regulations.

PER AERO DESIGN	PER [Signature]	UNIT NUMBER 003	DATE May 8
SHIPPER S. Fothergill	CARRIER CANADIAN FREIGHTWAYS	TIME 1:00	

For shipment tracking visit: www.canadianfreightways.com

0001 (02-01)

NUMBER OF PIECES RECEIVED ▲

DOCK COPY

PACKING SLIP

7 May, 2003

Address:

Wisk-Air Helicopters
520 Orville Wieben Crescent
Thunder Bay, Ontario
P7E 6M9

(807) 475-4510

Attention:

Mark Wiskemann

Reference: Return & Repair

Quantity Ordered	Quantity Shipped	Description	Part Number
✓ 1	1	200 Lb Cargo Basket Assembly	49205-01
✓ 1	1	Forward Support Beam	49221-01
✓ 1	1	Aft Support Beam	49221-02
✓ 2	2	Forward External Attachment Fitting	49311-01
✓ 2	2	Aft External Attachment Fitting	49312-01
✓ 4	4	Barrel Nut	49320-01
✓ 5	5	Bolt	AN4-24A
✓ 10	10	Washer	AN960JD416
✓ 5	5	Nut	MS21044N4
✓ 4	4	Bolt	AN6-17A
✓ 4	4	Washer	AN960JD616
✓ 1	1	Installation Drawing – Cargo Basket	49201
✓ 1	1	Installation Drawing – Fittings	49301
✓ 1	1	Maintenance Instructions (copy)	MI 492.01
✓ 1	1	Flight Manual Supplement (copy)	FMS 492.01
✓ 1	1	Flight Manual Supplement (copy)	FMS 493.01
✓ 1	1	Document Control List (copy)	DCL 492
✓ 1	1	Document Control List (copy)	DCL 493
✓ 1	1	Supplemental Type Certificate (copy)	SH00-48
✓ 1	1	Lid Brace Ass'y	36280
✓ 1	1	Bolt	AN3-15A
✓ 1	1	Bolt	AN3-17A
✓ 2	2	Washer	AN970-3
✓ 4	4	Washer	AN960-10
✓ 2	2	Nut	MS21044N3
✓ 1	1	Lid Brace Installation Drawing	49205-04

WHITE

- Thunder Bay

- BLACK - DRYDEN

WISK

S20 - ORVILLE WIEREN CK
T.B. ONT
P7E 6M9

4510

DRYDEN

807 - 937 - 4111

} HOLD FOR
PICKUP

GREG HEURING

STE

278 7383

YC Graphics

Track 1" x 1/8" L 

1 stop / bolt

SCHAEFER
MACHINE

25-287

17-59

72A49

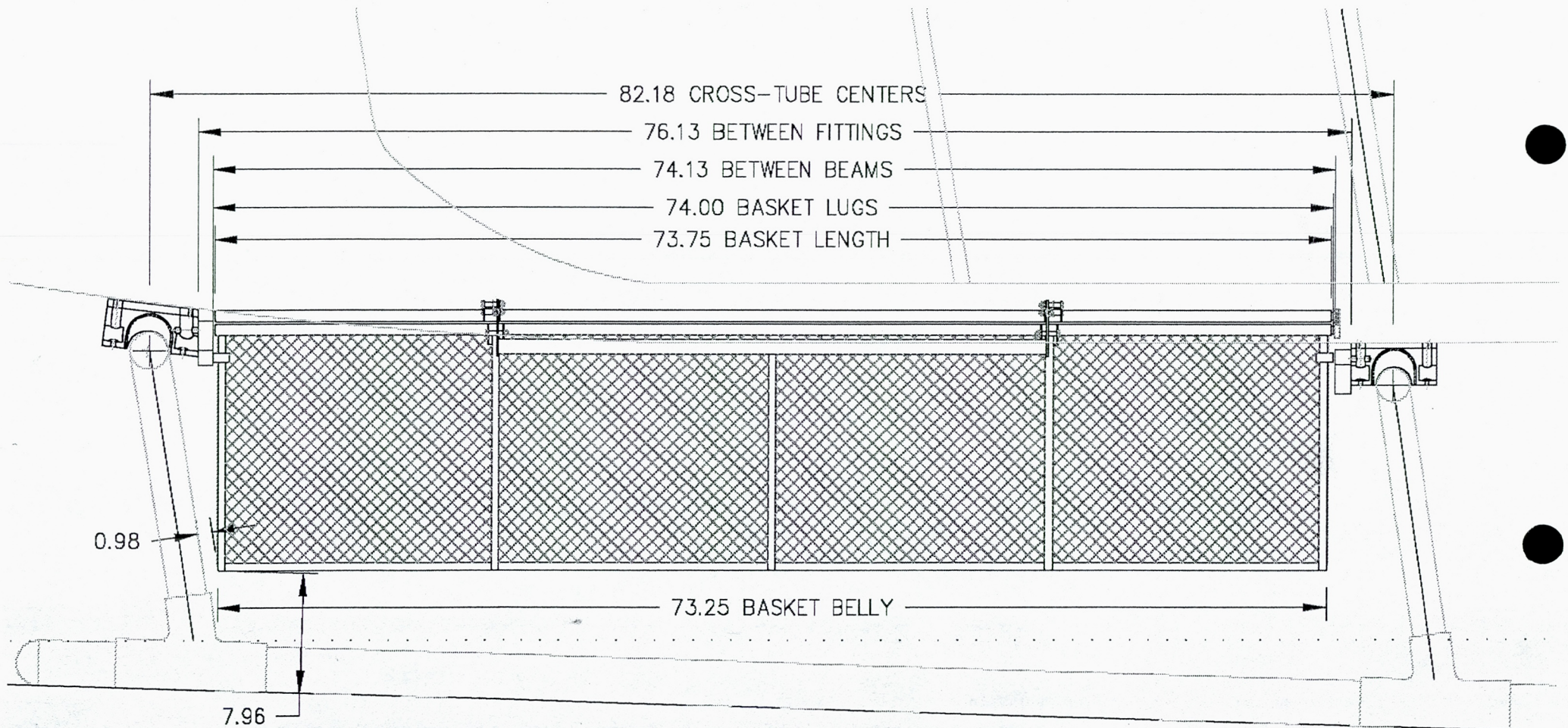
73752

03-86

505-82

SEPT 3RD

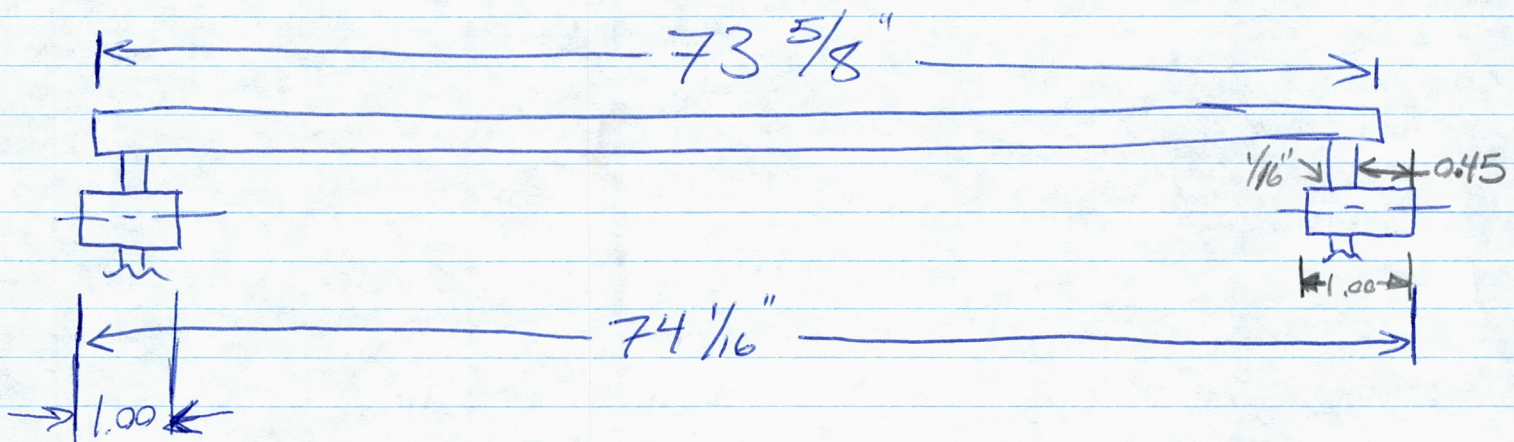
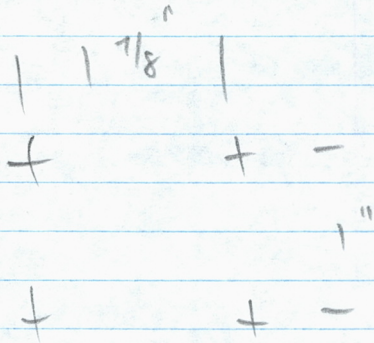
BUILD NEW 206L BASKET ACCORDING TO THESE
DIMENSIONS AS MEASURED FROM TEST FIT HELICOPTER.



BELL 206L ON HIGH SKID GEAR

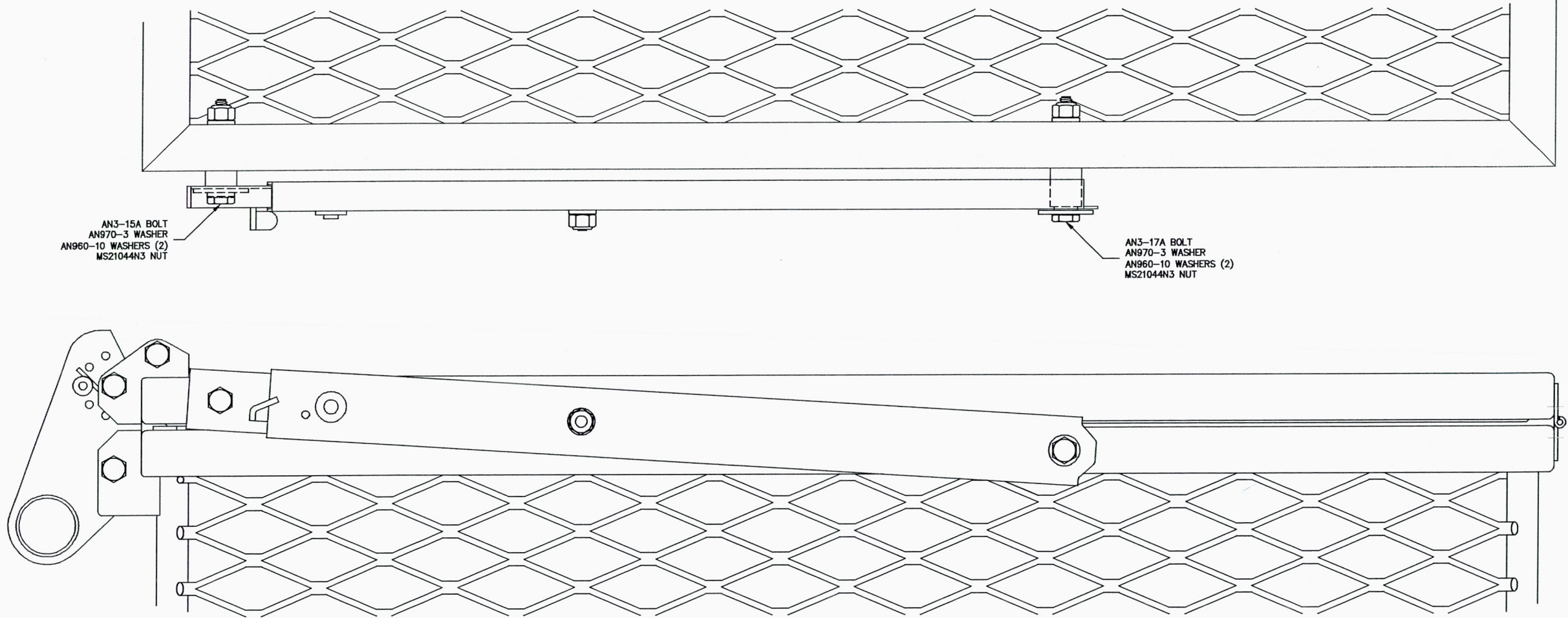
1.25 x 4.50.125.125 - ANGLE
MIN

1 5/8 - 1 3/4 GAP



- DRAWING 49209 CHANGED

- RIM + END HOOPS LOCATED IN JIG ACCORDING TO THESE DIMENSIONS.



2	MS21044N3	07	NUT			
4	AN960-10	06	WASHER			
2	AN970-3	05	WASHER			
1	AN3-17A	04	BOLT			
1	AN3-15A	03	BOLT			
1		02	LID BRACE ASSEMBLY			
	49205-04	01	LID BRACE INSTALLATION			
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC.	STOCK SIZE

QTY.

LIST OF MATERIALS

APPROVALS

DATE

DRAWN: S. FAHEY

CHECKED:

STRESS:

APR 22/03

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON:

DECIMALS

ANGLES

X.XXX ±0.010

X.XX ±0.03

X.X ±0.1

±1/2"

AERO DESIGN LTD.

ENGINEERING CONSULTANTS

1045 McTAVISH ROAD N.E.

CALGARY, ALBERTA T2E 7G9

BELL 206L

CARGO BASKET

LID BRACE INSTALLATION

NOT TO SCALE

DWG. SIZE

DWG. NO.

REV.

SHEET 1 OF 1

49205-04

0

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE: Nov 21, 2002

TIME: 9:50 Am

TO: KEVIN
WISK-AR

PHONE:

FAX: 807-473-5485

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 3

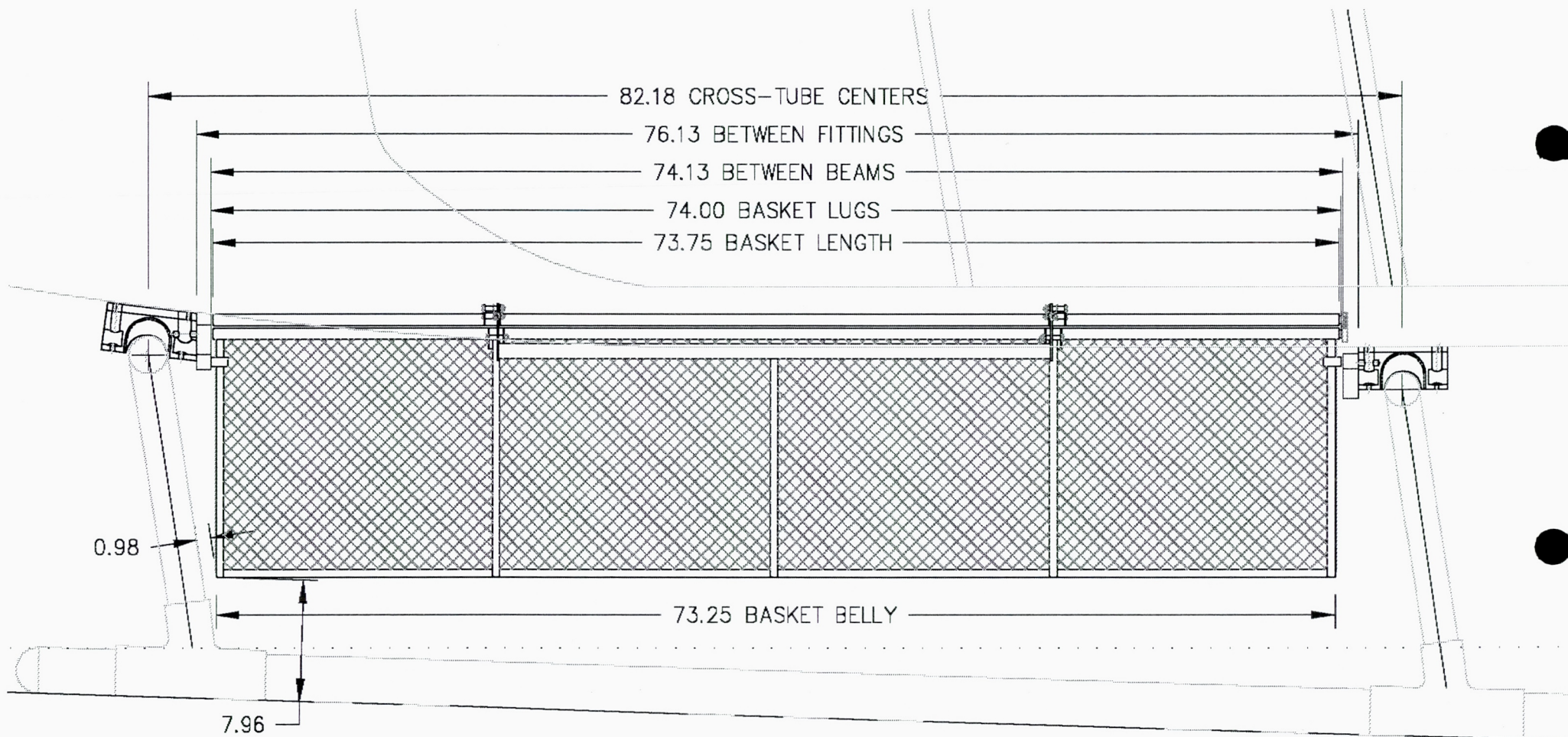
RE: STC - BASKET

For Your RECORDS

STEVE

SEPT 3RD

BUILD NEW 206L BASKET ACCORDING TO THESE
DIMENSIONS AS MEASURED FROM TEST FIT HELICOPTER.



BELL 206L ON HIGH SKID GEAR

PHOSPHATE COATING

VALLEY METAL - DUANE

- HAS HEARD OF IT
- DOESN'T DO IT
- EXCLUSIVE PROCESS FROM POWDER COATING
- STEEL PARTS CAN BE "PHOSPHATE CLEANED" ALONG WITH SANDBLASTING PRIOR TO POWDER COATING

TOP GUN

250-5393

HUGH

ENTIRE TREATMENT

ACID BATH

WATER

FLASH

PHOS

POWDER

FIX

CAN - WASH

- ETCH

- REDO

WELD ON EDGES IS BEST

- SILICONE IN + AROUND EDGES

From :

PHONE No. : 00

Jul. 12 2002 11:52AM P01

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE:	July 12, 2002	TIME:	11:52 AM
TO:	Jack Staal	PHONE:	780-495-5227
	Transport Canada	FAX:	780-495-7963
FROM:	S. Fahey	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 8

RE: STC REVISION APPLICATION AND DOCUMENTS

Enclosed with this fax are:

Modification Approval Request Application Form	MOD492, Rev. 1
Document Control List	DCL492, Rev. 2
Maintenance Instructions - Cargo Basket	MI 492.01, Rev. 1
Document Control List	DCL493, Rev. 3
Maintenance Instructions - Provisions	MI 493.01, Rev. 0

Please review these documents and re-issue SH00-48. The FAA application is, of course, on hold until this can be cleared up. Would you be willing to switch out the superseded documents for the new ones? (It would save postage both ways) I'll fix the cover letter here and send it up to you once we are finished with this revision.

Steve

Steve, I will switch out
the documents in FAA
package, with latest copies.
Thanks.

J. Staal
12 July 2002

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: July 12, 2002

TIME: 11:52 AM

TO: **Jack Staal**
Transport Canada

PHONE: 780-495-5227

FAX: 780-495-7963

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 8

RE: STC REVISION APPLICATION AND DOCUMENTS

Enclosed with this fax are:

Modification Approval Request Application Form	MOD492, Rev. 1
Document Control List	DCL492, Rev. 2
Maintenance Instructions – Cargo Basket	MI 492.01, Rev. 1
Document Control List	DCL493, Rev. 3
Maintenance Instructions – Provisions	MI 493.01, Rev. 0

Please review these documents and re-issue SH00-48. The FAA application is, of course, on hold until this can be cleared up. Would you be willing to switch out the superseded documents for the new ones? (it would save postage both ways) I'll fix the cover letter here and send it up to you once we are finished with this revision.

Steve

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD492, Rev. 1

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		2. IDENTIFICATION OF PRODUCT				
ALL CORRESPONDANCE TO: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		MAKE: Bell		MODEL: 206L, 206L-1, 206L-3, 206L-4		
		SERIAL No.: All Applicable		REGISTRATION: All Applicable		
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input checked="" type="checkbox"/> STC/STA No. SH00-48, Issue 2				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/> LSTC/LSTA No.				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: Installation of Side-Mounted Cargo Basket						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Basket is approximately 74" long, 22" wide. Located below doors and between cross-tubes to the side of helicopter. Supported by beams mounted on external attachment provisions. Helicopter can be flown with provisions in place and basket removed (configuration A) or basket fully installed (configuration B).						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. <u>H-92</u> B. TC No. <u>H2SW</u> C. OTHER _____						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input type="checkbox"/> B. SAME AS TC <input checked="" type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify) _____						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT		X				
MAINTENANCE MANUAL SUPPLEMENT		X				
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X				
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA			X			
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA		X				
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
Aero Design Ltd.						
PER: <u>STEVEN ATTEP</u>		Consultant <u>FOR E. BURGON</u>			12 July, 2002	
SIGNATURE OF APPLICANTS		TITLE			DATE	
11.						
SIGNATURE OF REGIONAL ENGINEER					DATE	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	0
FMS492.01	Flight Manual Supplement	1
MI492.01	Maintenance Instructions	1
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	0
49207	Cargo Basket Lid	0
49208	Cargo Basket Body	0
49209	End Hoop Assembly	0
49210	Basket Components – Hoops	0
49211	Basket Components – Rim	0
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	0
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	0
49218	Placard	0
49221	Support Beams	0
36255	Handle Assembly	0
36261	Handle Bar Assembly	0
36262	Handle Bracket Assembly	0
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	0
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	0
36280	Brace	0
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
APPROVAL:	ORIGINAL DATE: 17 May, 2002	AERO DESIGN LTD. 1045 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 12 July, 2002	
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	<div>Rev.</div> <div>DCL492</div> <div>2</div>	

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 492.01**

External Cargo Basket

Bell 206L Series

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Date: 19 June, 2002

Revision 1, 12 July, 2002

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

NOTICE: This manual contains information and data which is proprietary to AERO DESIGN LTD. This manual, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO DESIGN LTD.

1.0 INTRODUCTION

The Cargo Basket mounts to the side of the helicopter, supported by two beams bolted to the External Attachment Provisions. The provisions are incorporated into landing gear fittings that replace the existing fittings.

2.0 REFERENCE

AC43.13-1B

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube to tube welds and mesh to tube welds every 100 hours for cracks, defects or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours for cracks, defects or other damage.
- Visually inspect bolt attaching the basket to the beams every 100 hours for security and damage.
- Visually inspect bolts attaching beams to external attachment provisions every 100 hours for security and damage.

3.3 External Attachment Provisions

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Basket is fabricated from the following materials:

Lid and Rim:	3/4" x 0.035" square 4130 steel tube
Frames:	1/2" x 0.035" square 4130 steel tube
Mesh:	3/4" 18 ga. (0.040") expanded carbon steel mesh

Repair in accordance with AC43.13-1B, Chapter 4, as required.

4.2 Beams

DO NOT REPAIR MAJOR DAMAGE TO BEAMS. Replace beam if major damage is found.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005/-0.0000)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005/-0.0000)
 - 2. Insert NAS76A6-100 bushing

4.3 Landing Gear Attachment Fittings

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS. Replace External Attachment Fittings if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49301	External Attachment Provisions Installation	1
FMS493.01	Flight Manual Supplement	0
MI 493.01	Maintenance Instructions	0
FABRICATION DOCUMENTS		
49311	Forward Fitting	0
49312	Aft Fitting	0
49311	Forward Fitting	1
49312	Aft Fitting	1
49319	Washer	0
49320	Barrel Nut	0
49320	Barrel Nut	1
49321	Spacer	0
ENGINEERING DOCUMENTS		
ER493.01	Engineering Report	0
ER493.03	Test Report	0
261.02	Honeycomb Insert Load Test Report	0
APPROVAL:	ORIGINAL DATE: 19 May, 2002	AERO DESIGN LTD. 1045 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 12 July, 2002	
	SHEET 1 OF 1	BELL 206L SERIES External Attachment Provisions
	DCL493	Rev. 3

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 493.01**

External Attachment Provisions

Bell 206L Series

Approved: E. Burgoin, P. Eng.

Prepared by: S. Fahey

Date: 12 July, 2002
Revision 0

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

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1.0 INTRODUCTION

Provisions for attaching external equipment to the helicopter are incorporated into fittings that replace the existing fittings which mount the helicopter on the landing gear cross tubes.

2.0 REFERENCE

AC43.13-1B

3.0 INSPECTION PROCEDURES

- Visually inspect fittings every 100 hours for cracks, defects or other damage.
- Visually inspect hardware attaching fittings to helicopter, and hardware attaching cross-tubes to fitting, every 100 hours for security and damage.

4.0 REPAIR PROCEDURES

DO NOT REPAIR MAJOR DAMAGE TO FITTINGS. Replace External Attachment Fittings if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour. Touch up paint as required.
- (b) Do not repair elongation of provision bolt hole (AN6 bolt). Hole is nominally 0.391" in diameter with 1/4" maximum freedom of motion left and right.
- (c) Do not repair elongation of barrel nut hole. Hole is nominally 3/4" in diameter.

AERO Design Ltd.
1045 McTavish Road NE
Calgary, AB, T2E 7G9
email: ted.aerodesign@telusplanet.net

FACSIMILE COVER PAGE

To: Jack Staal	From: E. Burgoin
Fax #: 17804957963	Fax #: (403) 250-8333
Company: Transport Canada	Tel #: (403) 250-8027
Subject: Application and DCL (with FMS correction, too)	
Sent: 7/12/02 at 10:23:16 AM	Pages: 3 (including cover)

MESSAGE:

Application and DCL. Please destroy copy of DCL492, Revision 2, which I faxed to you just minutes ago.

Steve

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD492, Rev. 1

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		2. IDENTIFICATION OF PRODUCT	
		MAKE: Bell	MODEL: 206L, 206L-1, 206L-3, 206L-4
ALL CORRESPONDANCE TO: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		SERIAL No.: All Applicable	REGISTRATION: All Applicable
3. REQUEST FOR:			
A. SUPPLEMENTAL TYPE CERTIFICATE (STC) <input type="checkbox"/>			
B. STC/STA REVISION <input checked="" type="checkbox"/>		STC/STA No. SH00-48, Issue 2	
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC) <input type="checkbox"/>			
D. LIMITED STC/STA REVISION <input type="checkbox"/>		LSTC/STA No.	
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE <input type="checkbox"/>			
F. F.A.A. STC REVISION <input type="checkbox"/>		STC No.	
G. FAMILIARIZATION OF F.A.A. STC <input type="checkbox"/>		STC No.	
H. REPAIR DESIGN APPROVAL (RDC) <input type="checkbox"/>			
I. PARTS DESIGN APPROVAL (PDA) <input type="checkbox"/>			
4. TITLE OF MODIFICATION OR REPAIR: Installation of Side-Mounted Cargo Basket			
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Basket is approximately 74" long, 22" wide. Located below doors and between cross-tubes to the side of helicopter. Supported by beams mounted on external attachment provisions. Helicopter can be flown with provisions in place and basket removed (configuration A) or basket fully installed (configuration B).			
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:			
A. TA NO. H-92		B. TC No. H2SW	
		C. OTHER	
7. PROPOSED BASIS OF APPROVAL:			
A. SAME AS TA <input type="checkbox"/>		B. SAME AS TC <input checked="" type="checkbox"/>	
		C. OTHER <input type="checkbox"/> (Please specify)	
8. DOCUMENTATION CHECKLIST		REQUIRED	
		YES	NO
COMPLIANCE PROGRAM		X	
MASTER DRAWING LIST		X	
FLIGHT MANUAL SUPPLEMENT		X	
MAINTENANCE MANUAL SUPPLEMENT		X	
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X	
ENGINEERING REPORTS		X	
DESIGN DRAWINGS			X
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X	
ELECTRICAL LOAD ANALYSIS			X
DRAFT STC, LSTC OR RDA			X
WEIGHT AND MOMENT CHANGE		X	
FLIGHT TEST DATA		X	
OTHER (Specify)			
9. APPLICANT'S REMARKS:			
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4. Aero Design Ltd.			
PER: _____ SIGNATURE OF APPLICANTS		Consultant _____ TITLE	
		12 July, 2002 DATE	
11.			
_____ SIGNATURE OF REGIONAL ENGINEER		_____ DATE	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	0
FMS492.01	Flight Manual Supplement	1
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	0
49207	Cargo Basket Lid	0
49208	Cargo Basket Body	0
49209	End Hoop Assembly	0
49210	Basket Components – Hoops	0
49211	Basket Components – Rim	0
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	0
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	0
49218	Placard	0
49221	Support Beams	0
36255	Handle Assembly	0
36261	Handle Bar Assembly	0
36262	Handle Bracket Assembly	0
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	0
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	0
36280	Brace	0
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
MI492.01	Maintenance Instructions	0
APPROVAL:	ORIGINAL DATE: 17 May, 2002	AERO DESIGN LTD. 1046 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 12 July, 2002	
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	<div> <div>DCL492</div> <div>Rev.</div> <div>2</div> </div>	

AERO DESIGN LTD.

1045 McTavish Rd. N.E., Calgary, Alberta, T2E 7G9

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

09 July, 2002

Transport Canada
Aircraft Certification Division
Edmonton Aircraft Certification Office
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Our File # : 492/493

Your File # : C-SH00-48

Re: Application for FAA STC on Bell 206L Cargo Basket

Jack,

A separate FAA STC approval is sought for the 206L series. An application for approval of the 407 basket will be sent separately. Two complete packages of project data are enclosed; one as you have requested for your records, and the other to forward to the FAA. Copies of the following documents are enclosed in both packages:

Modification Approval Request Application Form	MOD492A	Revision 0
FAA STC Application Form	FAA492	Revision 0
Supplemental Type Certificate	SH00-48	Issue 2
Compliance Program	CP492	Revision 3
Compliance Program	CP493	Revision 0
Project Summary	PS492	Revision 0
Project Summary	PS493	Revision 0
Document Control List	DCL493	Revision 2
Document Control List	DCL492	Revision 1
Flight Manual Supplement	FMS492.01	Revision 1
Flight Manual Supplement	FMS493.01	Revision 0

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Maintenance Instructions	MI492.01	Revision 0
Engineering Report	ER492.01	Revision 0
Engineering Report	ER492.02	Revision 0
Engineering Report	ER493.01	Revision 0
Engineering Report	ER493.03	Revision 0
Engineering Report	261.02	Revision 0
Flight Test Report	Mark Wiskemann, Wisk-Air,	June 17/02
Flight Test Report	Serge Massicotte, Transport Canada,	June 20/02

Installation Drawing – External Attachment Provisions	49301	Revision 1
Fabrication Drawings	49311	Revision 0
	49311	Revision 1
	49312	Revision 0
	49312	Revision 1
	49319	Revision 0
	49320	Revision 0
	49320	Revision 1
	49321	Revision 0

Installation Drawing – Cargo Basket	49201	Revision 0
Assembly Drawings	49205	Revision 0
	49207	Revision 0
	49208	Revision 0
	49209	Revision 0
Fabrication Drawings	49210	Revision 0
	49211	Revision 0
	49212	Revision 0
	49213	Revision 0
	49214	Revision 0
	49215	Revision 0

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Assembly Drawings

Fabrication Drawings

49216 Revision 0

49217 Revision 0

49218 Revision 0

49221 Revision 0

36255 Revision 0

36261 Revision 0

36262 Revision 0

36271 Revision 0

36272 Revision 0

36273 Revision 0

36274 Revision 0

36275 Revision 0

36276 Revision 0

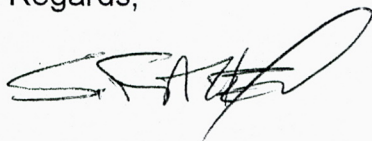
36277 Revision 0

36278 Revision 0

36280 Revision 0

Please forward one data package to the responsible office at the FAA.

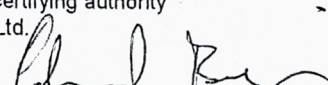
Regards,



Steven Fahey, Technologist

Encl.

No certificate may be issued unless a completed application form has been received.

U.S DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		FORM APPROVED O.M.B. No. 04-R0078
APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE		
1. Name and address of applicant Aero Design Ltd. 1045 McTavish Road, NE Calgary, Alberta, Canada, T2E 7G9	2. Application made for: <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate	3. Product involved: <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller
4. TYPE CERTIFICATE (Complete item 4a below)		
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material specifications, construction and performance of the aircraft, aircraft engine propeller which is the subject of this application.		
5. PRODUCTION CERTIFICATE (Complete items 5a - c below. Submit with this form in manual form one copy of quality control data or changes thereto covering new products as required by applicable FAR)		
a. Factory address (If different from above)	b. Application if for: <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.)	P.C. No.
c. Applicant is holder of license under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)		T.C. / S.T.C. No.
6. SUPPLEMENTAL TYPE CERTIFICATE (complete items 6a - d below)		
a. Make and model designation of product to be modified Bell 206L, 206L-1, 206L-3, 206L-4 Helicopter		
b. Description of modification Installation of Side-Mounted Cargo Basket. Basket is 74" long by 22" wide. Basket mounted by two support beams (fore and aft) attached to external attachment provisions. Provisions replace landing gear fuselage-cross-tube fittings.		
c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	d. Will parts be manufactured for sale? (Ref: FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
7. CERTIFICATION - I certify that the above statements are true.		
Signature of certifying authority Aero Design Ltd. 	Title Consultant, DAR 290M	Date 09 July, 2002

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD492A, Rev. 0

1. NAME AND ADDRESS OF APPLICANT:

AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, AB, T2E 7G9

2. IDENTIFICATION OF PRODUCT

MAKE:

Bell

MODEL:

206L, 206L-1, 206L-3,
206L-4

ALL CORRESPONDANCE TO:

AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, AB, T2E 7G9

SERIAL No.:

All Applicable

REGISTRATION:

All Applicable

3. REQUEST FOR:

- A. SUPPLEMENTAL TYPE CERTIFICATE (STC) ☐
- B. STC/STA REVISION ☐ STC/STA No.
- C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC) ☐
- D. LIMITED STC/STA REVISION ☐ LSTC/LSTA No.
- E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE ☒
- F. F.A.A. STC REVISION ☐ STC No.
- G. FAMILIARIZATION OF F.A.A. STC ☐ STC No.
- H. REPAIR DESIGN APPROVAL (RDC) ☐
- I. PARTS DESIGN APPROVAL (PDA) ☐

4. TITLE OF MODIFICATION OR REPAIR:

Installation of Side-Mounted Cargo Basket

5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:

Basket is approximately 74" long, 22" wide. Located below doors and between cross-tubes to the side of helicopter. Supported by beams mounted on external attachment provisions. Helicopter can be flown with provisions in place and basket removed (configuration A) or basket fully installed (configuration B).

6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:

A. TA NO. H-92 B. TC No. H2SW C. OTHER

7. PROPOSED BASIS OF APPROVAL:

A. SAME AS TA ☐ B. SAME AS TC ☒ C. OTHER ☐ (Please specify)

8. DOCUMENTATION CHECKLIST	REQUIRED		FOR DOT USE ONLY		
			RECEIVED		
	YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM	X				
MASTER DRAWING LIST	X				
FLIGHT MANUAL SUPPLEMENT	X				
MAINTENANCE MANUAL SUPPLEMENT	X				
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X			
ENGINEERING REPORTS	X				
DESIGN DRAWINGS		X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X				
ELECTRICAL LOAD ANALYSIS		X			
DRAFT STC, LSTC OR RDA		X			
WEIGHT AND MOMENT CHANGE	X				
FLIGHT TEST DATA	X				
OTHER (Specify)					

9. APPLICANT'S REMARKS:

10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

Aero Design Ltd.

PER:

SIGNATURE OF APPLICANTS

Consultant

TITLE

09 July, 2002

DATE

11.

SIGNATURE OF REGIONAL ENGINEER

DATE

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T**DATE:** July 9, 2002**TIME:** 5:16 PM**TO:** **Roger Reid****PHONE:** 250-765-0100**Northern Air Support****FAX:** 250-765-0077**FROM:** S. Fahey
Aero Design Ltd.**PHONE:** 403-250-8027**FAX:** 403-250-8333

Number of pages including cover sheet: 6

RE: CARGO BASKETS

Mr. Reid,

I have enclosed a set of drawings and photos that illustrate the cargo basket installations we have approved on the 407 and 206L series. Bell 206B and AS350 basket designs are in progress, but may not get into high gear until we have a firm order. The 407 basket was developed first, and through working around the existing fittings, it was realized that what really needed to be done was replace the landing gear fittings outright, with something more useful. The landing gear fittings of the 206L's are replaced with fittings we designed, providing extra attachment points for mounting the basket beams.

Maximum capacity of the 206L basket is 200 pounds. The 407 basket can take 150 pounds with the 6061 beams supporting it, and 200 pounds when it is supported by the 7075 beams.

407 Basket:

96" x 22" x 21"

200 Pound Capacity (7075 beams)

150 Pound Capacity (6061 beams)

High-Skid gear required (flite-step OK)

Requires Push-Out window installed for emergency exit on r/h side.

Not compatible with Pop-Out Float Kit (despite being shown in photo)

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206L Series Basket:

74" x 22" x 17.5"

200 Pound Capacity

High-Skid gear required (RHS Flite-step must be removed)

Does not interfere with doors. Do not stand or walk on lid.

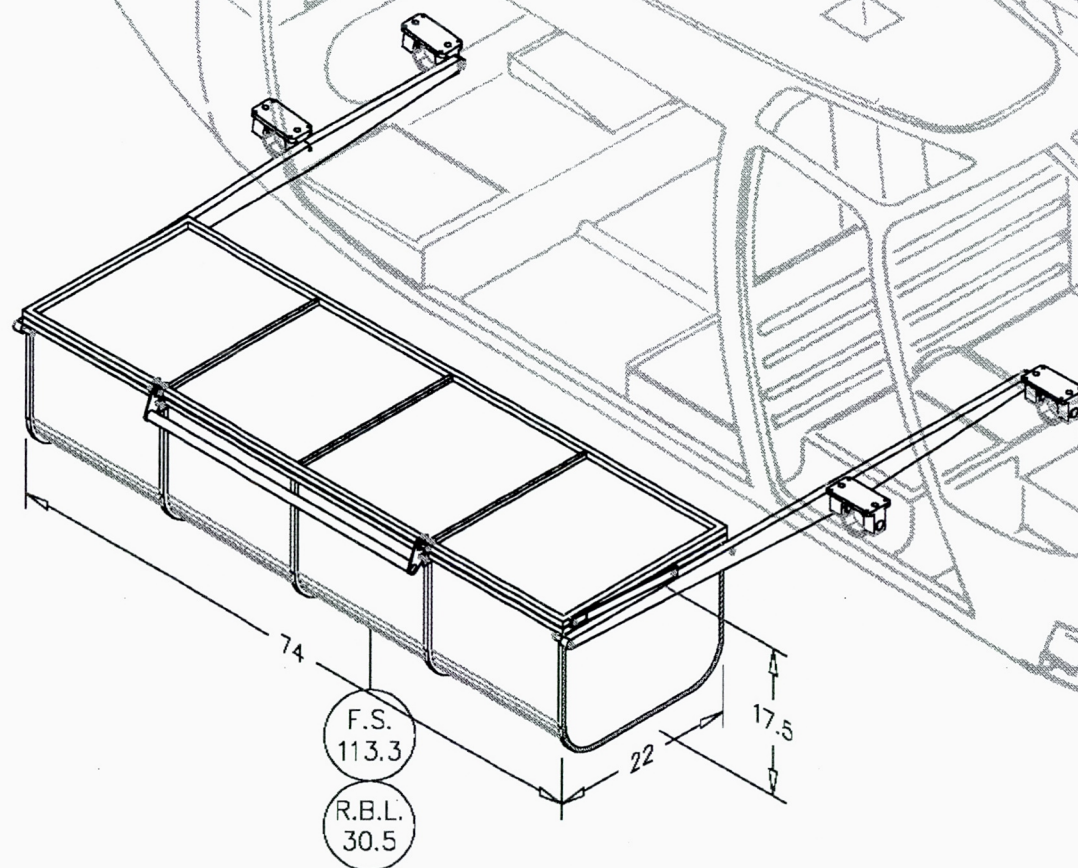
Not compatible with Pop-Out Float Kit

Both baskets are to be installed on the right-hand side of the helicopter, so that the pilot can shut the lid from his seat, should it inadvertently be left open by personnel on the ground. The lid snaps and locks shut under its own weight.

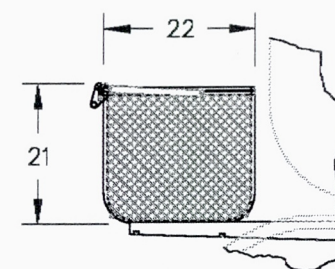
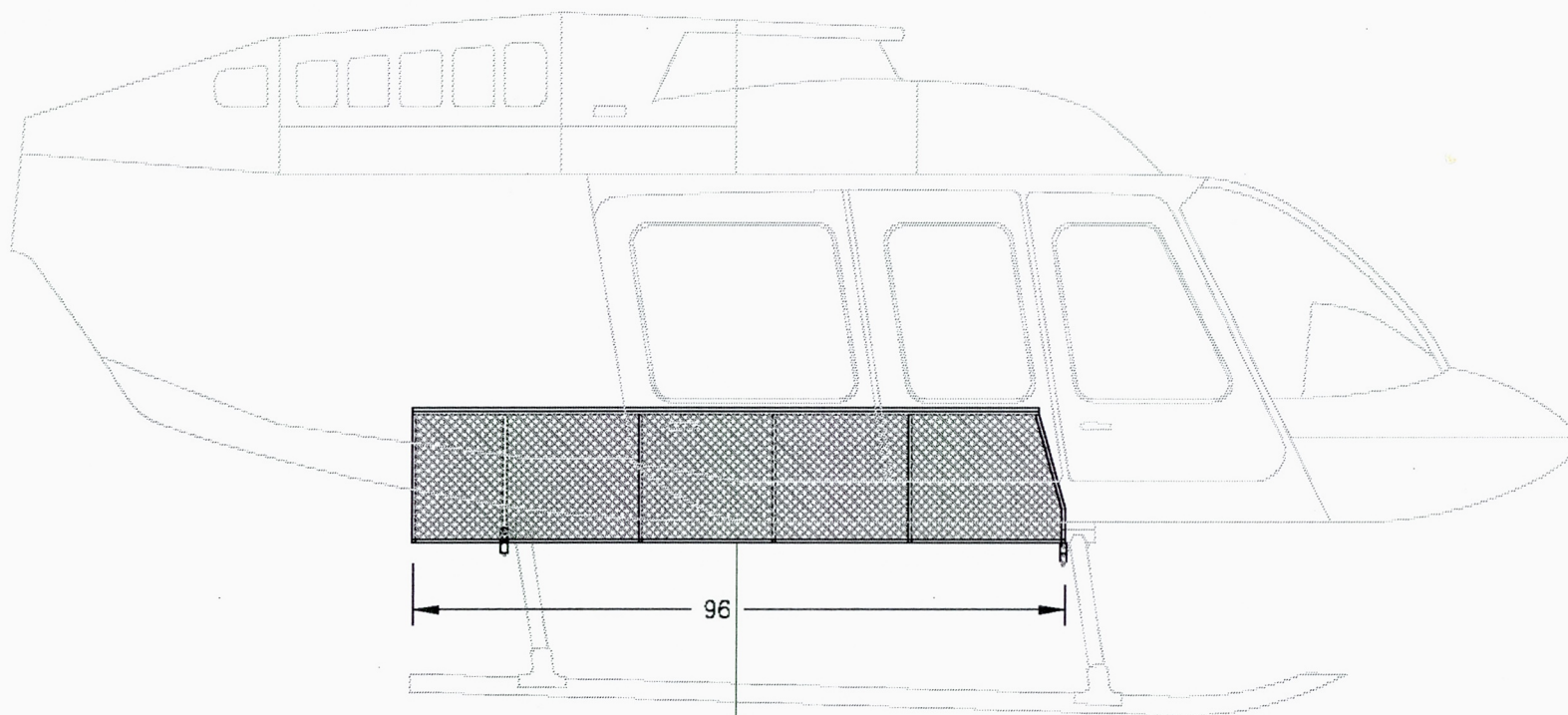
Steve



BELL 206L SERIES CARGO BASKET, SHOWING LANDING GEAR
FITTINGS REPLACED BY EXTERNAL ATTACHMENT PROVISIONS







F.S.
157.75

BELL 407 CARGO BASKET INSTALLATION



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17 matches found

Current Information, directly from the Official Canadian Civil Aircraft Register database.

Owner name	Mark	Common Name	Model	Owner Registered Since	Serial N
1 Universal Helicopters Newfound	C-FHHH	Aerospatiale	AS 350 BA	1998-05-06	1421
2 Universal Helicopters Newfound	C-FLIA	Bell	206L-4	2000-05-18	52149
3 Universal Helicopters Newfound	C-FPHO	Bell	206L	2001-07-10	45147
4 Universal Helicopters Newfound	C-FVEF	Bell	206L-4	1995-04-26	52071
5 Universal Helicopters Newfound	C-FXAL	Aerospatiale	AS 350B	1998-05-21	1816
6 Universal Helicopters Newfound	C-FXYF	Bell	407	1996-05-22	53022
7 Universal Helicopters Newfound	C-GAHS	Bell	206L	1987-03-19	45048
8 Universal Helicopters Newfound	C-GDCA	Bell	206L	1993-08-30	45021
9 Universal Helicopters Newfound	C-GINV	Bell	206B	2001-04-30	1663
10 Universal Helicopters Newfound	C-GIZY	Bell	206L	1987-03-20	45027
11 Universal Helicopters Newfound	C-GLSH	Bell	206L	1988-04-14	45018
12 Universal Helicopters Newfound	C-GOFL	Bell	407	1997-04-03	53130
13 Universal Helicopters Newfound	C-GQIX	Bell	206L	1995-07-06	45008
14 Universal Helicopters Newfound	C-GQNS	Bell	206L	1987-03-20	45134
15 Universal Helicopters Newfound	C-GTHE	Bell	206L-4	1997-04-08	52035

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Current Information, directly from the Official Canadian Civil Aircraft Register database.

Owner name	Mark	Common Name	Model	Owner Registered Since	Serial Nu
16 Universal Helicopters Newfound	C-GVYM	Bell	206L	1988-06-09	45143
17 Universal Helicopters Newfound	C-GVYO	Bell	206L	1987-03-19	46609

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History for this Mark

History for th

Current Information, directly from the Official Canadian Civil Aircraft Register

Mark	C-FVEF	Serial No	5207
Common Name	Bell	Model	206L
Base Of Op. - Country	CANADA		
Base Of Op. - Province	Newfoundland		
Base Of Op. - Location	St. John'S		
File Location	Moncton	Basis for Eligibility for Registration	Type H92
Reg Purpose	Commercial	Flight Authority	Certif Airwo
Category	Helicopter	Weight (Kgs)	2018
Manufacturer	Bell Helicopter Division Textron Canada Ltd.		
Year of Manufacture	1994	Year Imported	1995
Country of Manufacture	CANADA		

Owner Registration

Owner Registered Since	1995-04-26	Last Certificate of Registration Issued	2000
Engine	Turbo Shaft	Number of Engines	1

Owner Information

Name (1 of 1)	Universal Helicopters Newfoundland Limited	Mail Recipient	Y
Address	P.O. Box 529, Stn. C, 82 Winnipeg Street		
City	Goose Bay	Province	
Postal Code	A0P 1C0	Region	A

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History for this Mark

History for th

Current Information, directly from the Official Canadian Civil Aircraft Register

Mark	C-FARE	Serial No	531
Common Name	Bell	Model	407
Base Of Op. - Country	CANADA		
Base Of Op. - Province	British Columbia		
Base Of Op. - Location	Kelowna		
File Location	Vancouver	Basis for Eligibility for Registration	Typ H92
Reg Purpose	Commercial	Flight Authority	Cert Airw
Category	Helicopter	Weight (Kgs)	249
Manufacturer	Bell Helicopter Textron A Division Of Textron Canada Ltd		
Year of Manufacture	1997		
Country of Manufacture	CANADA		

Owner Registration

Owner Registered Since	1999-12-13	Last Certificate of Registration Issued	199
Engine	Turbo Shaft	Number of Engines	1

Owner Information

Name (1 of 1)	Northern Air Support Ltd	Mail Recipient	Yes
Address	6285 Kelowna Airport		
City	Kelowna	Province	British
Postal Code	V1V 1S1	Region	Pacific

Last updated:

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10 matches found

Current Information, directly from the Official Canadian Civil Aircraft Register database.

Owner name	Mark	Common Name	Model	Owner Registered Since	Serial Nu
1 Northern Air Support Ltd	C-FAHE	Aerospatiale	AS 350 B-2	2001-11-01	2651
2 Northern Air Support Ltd	C-FAHS	Aerospatiale	AS 350 B-2	2001-11-01	2358
3 Northern Air Support Ltd	C-FARE	Bell	407	1999-12-13	53112
4 Northern Air Support Ltd	C-FFYO	Hughes	369D	2000-07-07	580315D
5 Northern Air Support Ltd	C-FQHB	Hughes	369D	2001-05-18	980334D
6 Northern Air Support Ltd	C-GAKF	Hughes	369D	1999-04-27	970197D
7 Northern Air Support Ltd	C-GBCW	Hughes	369D	1999-06-29	1260057D
8 Northern Air Support Ltd	C-GDCM	Hughes	369D	2000-12-15	310916D
9 Northern Air Support Ltd	C-GDMM	Aerospatiale	AS 350 B-2	1997-05-23	2980
10 Northern Air Support Ltd	C-GIHP	Bell	206B	1996-06-21	871

Page 1 / 1

[First Page](#)[Previous Page](#)[Next Page](#)[Last Page](#)[Return to Search](#)[Last updated:](#)[Important Notices](#)

AERO DESIGN LTD.

1045 McTavish Rd. N.E., Calgary, Alberta, T2E 7G9

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

05 July, 2002

Wisk-Air
304 Hector Dougall Way
Thunder Bay, Ontario
P7E 6M6

Attn: Mark Wiskemann

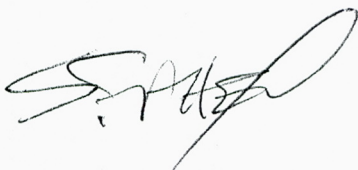
Re: Cargo Basket Hardware and Fittings

Mark,

Please find enclosed the NAS bolts for the aft fittings. You may change out the AN hardware at your convenience.

Further to our phone conversation with Alex, you may return the support beams and fuselage fittings at your convenience and our cost; Alex indicated that this would be likely at the end of the season. We will provide new beams and modify the fittings, making them much simpler to fit to the helicopter.

Regards,



Steven Fahey, Technologist

Encl.

PACKING SLIP

05 July, 2002

Address:

Wisk-Air Helicopters
304 Hector Dougall Way
Thunder Bay, Ontario
P7E 6M6

(807) 475-4510

Attention:

Mark Wiskemann

Reference: Your Purchase Order: 1076

Quantity Ordered	Quantity Shipped	Description	Part Number
4	4	Bolt	NAS6605-16
4	4	Bolt	NAS6605-19

Laser Equation Inc.
Industrial Cutting Solutions

Shipping Slip

Shipping # 14231
Customers PO#: N.A.

Customer

Name Aero Design Ltd.

Contact Steven

Phone# (403) 250-8027

Date shipped: _____

Quality checked by: _____

Desc: Plates #49221-02 AFT Mounting beam		Qty: 4
Material: Aluminum - 6061	Thickness (inch): 1	
Desc: Plates #49221-01 Forward Mounting beam		Qty: 4
Material: Aluminum - 6061	Thickness (inch): 1	

All shortages, discrepancies and problems must be claimed within 72 hours. All shipping must be claimed on the carrier.

Signed for by: _____

----- cut here -----

AERO Design Ltd.
1045 McTavish Road NE
Calgary, AB, T2E 7G9
email: steve.aerodesign@telusplanet.net

FACSIMILE COVER PAGE

To: Heli-Inter	From: Steven Fahey
Fax #: 18197573303	Fax #: (403) 250-8333
Company: Heli-Inter	Tel #: (403) 250-8027
Subject: FW: STC for Cargo Basket	
Sent: 7/3/02 at 12:32:08 PM	Pages: 11 (including cover)

MESSAGE:

Approval documents for the cargo basket, including approved Flight Manual Supplement. I will send clean copies in the mail, as soon as I have the originals in the mail from Transport myself.

I have put the fittings on Air Canada Cargo today, and they should arrive in Val d'Or tomorrow morning. A new set of installation drawings is also included.

Steven

AERO Design Ltd.
1045 McTavish Road NE
Calgary, AB, T2E 7G9
email: steve.aerodesign@telusplanet.net

FACSIMILE COVER PAGE

To: Mark Wiskemann	From: Steven Fahey
Fax #: 18074735485	Fax #: (403) 250-8333
Company: Wisk Air	Tel #: (403) 250-8027
Subject: FW:	
Sent: 6/28/02 at 11:34:36 AM	Pages: 11 (including cover)

MESSAGE:

Installation is approved in full. Clean copies to follow in the mail. You don't need to use the LSTC any more.

Steve

AERO Design Ltd.
1045 McTavish Road NE
Calgary, AB, T2E 7G9
email: steve.aerodesign@telusplanet.net

FACSIMILE COVER PAGE

To: Tony	From: Steven Fahey
Fax #: 12049433657	Fax #: (403) 250-8333
Company: Taiga Helicopters	Tel #: (403) 250-8027
Subject: FW:	
Sent: 6/28/02 at 11:17:06 AM	Pages: 11 (including cover)

MESSAGE:

Fully Approved. Clean copies will follow in the mail.

Steve

ONLY ONE ROLL OF FILM OR ONE SIZE PER ENVELOPE
UN ROULEAU DE FILM OU UN FORMAT PAR ENVELOPPE SEULEMENT

NAME/ NOM:

DUMAS

ADDRESS/ ADRESSE:

CITY/ VILLE:

PROV.:

POSTAL CODE:

TEL:

691-4556

DATE:

April 2/02

TIME/ HEURE:

READY/ PRÊT:

NEI,
11:00

FILM BRAND
MARQUE DE FILM

FILM SIZE
FORMAT

EXPOSURE
POSES

ASA
ISO

FILM PROCESS
DÉVELOPMENT

☐ AGFA

☐ 135

☐ 12

☐ 100

☐ C-41

☐ FUJI

☐ 110

☐ 15

☐ 200

2735

☐ KODAK

☐ 126

☐ 24

☐ 400

☐ BLACK & WHITE
NOIR ET BLANC

☐ 25

☐ KONICA

☐ IX240

☐ 36

☐ 1000

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☐ 40

☐ _____ ☐ _____

SPECIAL INSTRUCTIONS/
INSTRUCTIONS SPÉCIALE

PRINTS MADE/
NOMBRES D'ÉPREUVES

PRICE/ PRIX

12.69

TOTAL

N° 7 1 1 5 1 9



PHOTO IMAGE 2000 - CALGARY PLACE
#175, 345 - 4 AVE. S.W.
269-6622



THE POWER OF COLOR.

AGFA  **FILM**

**HIGH
DEFINITION
COLOR** FILM



PHOTO IMAGE 2000
(Kwan's Holdings inc.)
G.S.T. # R 124631219

06-18-02
16-09 0001
1 • 12 • 34 I
• 0 • 86 I TX
• 13 • 20 CH

PHOTO IMAGE 2000

345 4TH AVE SW #175

CALGARY AB

STORE 9075839 TERM A9075839

SLIP # 4276

** DIRECT PAYMENT ** PURCHASE **

AMOUNT \$13.20

50076600000860714

PAYMENT FROM SAVINGS ACCOUNT

JUNE/18/02 16:48 00 APPROVED

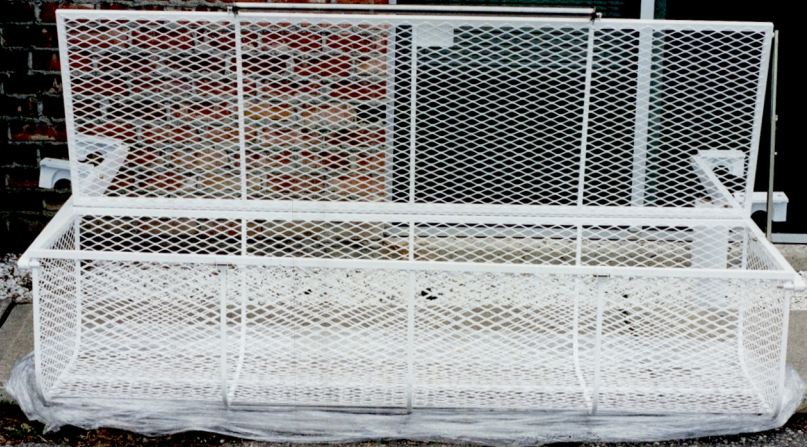
693001001001 677195 001









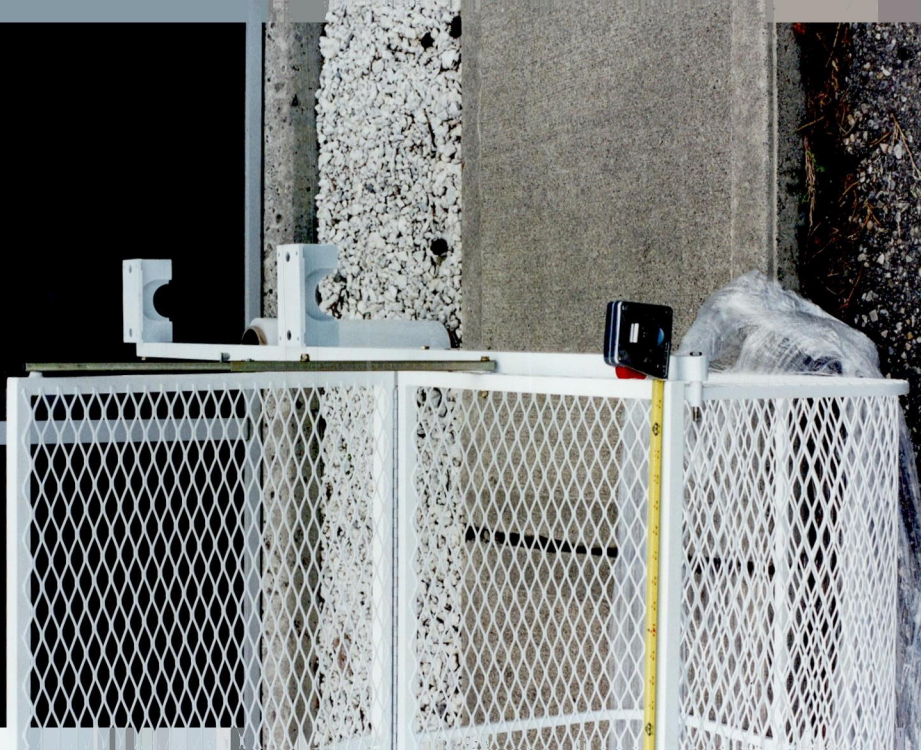






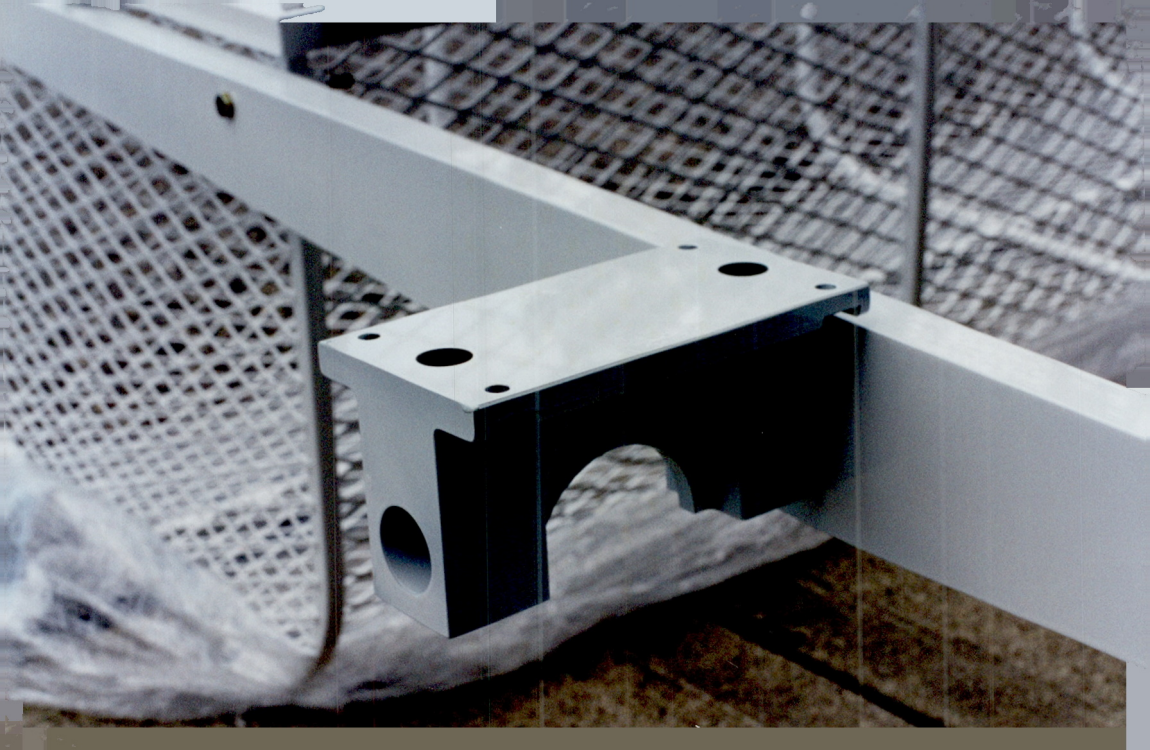




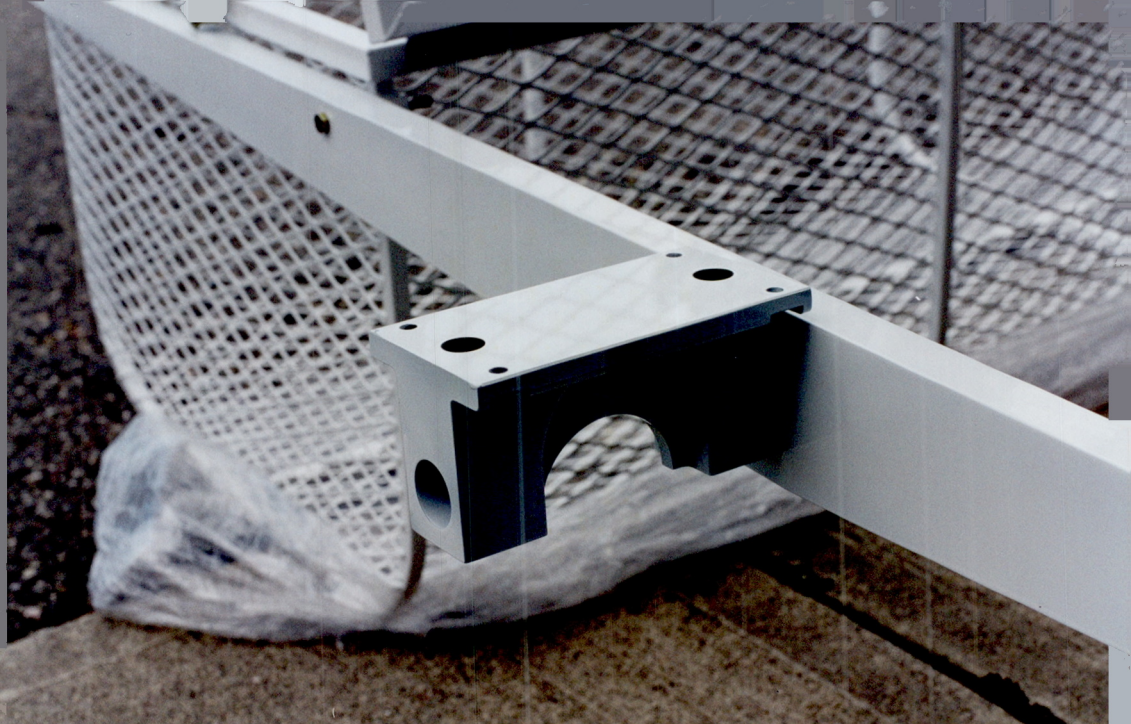


ARMED EXHIBITS, LTD.
1000 10TH AVENUE, SUITE 100
SAN CARLOS, CALIFORNIA 95060
900 LBS. TOTAL
75 LBS. / DAY























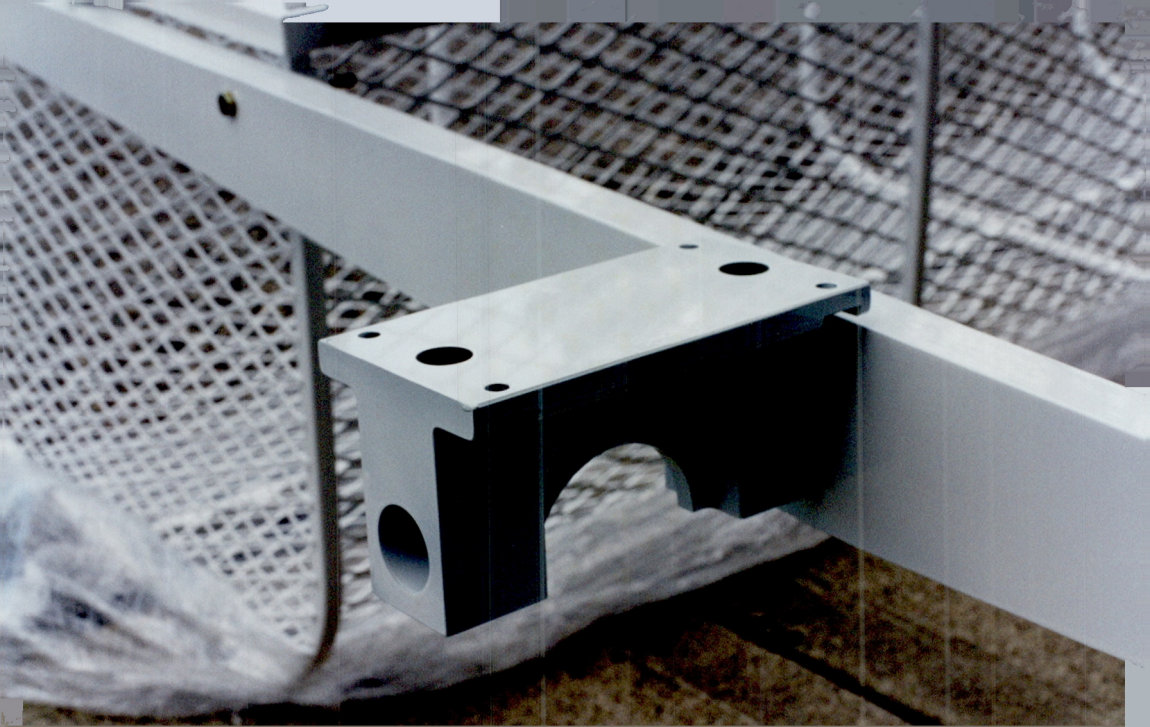




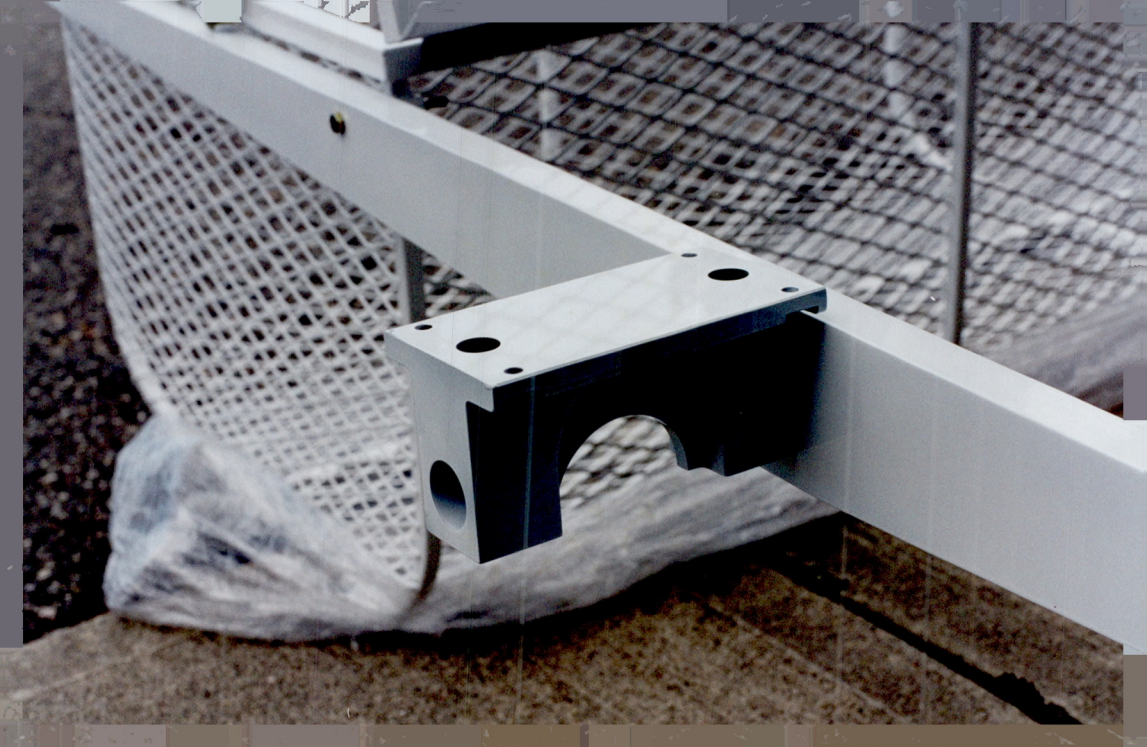


PERNO IN ORO 1.10
MATERIALE IN ORO 1.10
MATERIALE IN ORO 1.10
MATERIALE IN ORO 1.10
200 LBS. TOTAL
75 LBS. / DAY











Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, ALBERTA
T2E 7G9 CANADA

Number: SH00-48

Issue No.: 2

Approval Date: December 8, 2000

Issue Date: June 27, 2002

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L 1, 206L 3, 206L 4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of an Aero Design Ltd right hand cargo basket/external attachment provisions.

Installation/Operating Data,
Required Equipment and Limitations:

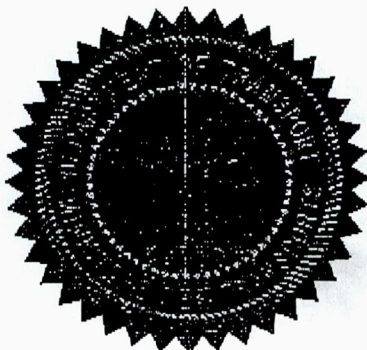
Bell 407 only:

Installation of Aero Design Ltd starboard cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 362, Rev. 2, dated 23 November 2000, or later approved revision.

Transport Canada approved Aero Design Ltd, Flight Manual Supplement FMS 362.01 Revision 1, dated 14 November 2000 is required with this installation.

(see continuation sheet)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



D.S. Austen
For Minister of Transport

Canada

(Continuation Sheet)

Number: SH00-48 Issue 2

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Bell 407 only (continued)

Aero Design Ltd Maintenance Manual Supplement MMS 362.01, Revision 0, dated 15 November 2000 is required with this installation.

Applicable placard required on the basket lid in accordance with installation drawing 36201.

Bell 206L, L-1, L-3, L-4, only:**Configuration A - External Attachment Provisions only:**

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 493, Rev. 2, dated 25 June 2002 or later approved revision.

Transport Canada approved Aero Design Ltd, Flight Manual Supplement FMS493.01, dated 19 May 2002, is required with this installation.

Configuration B - Starboard Cargo Basket installation:

Installation of configuration A, External Attachment Provisions is a prerequisite for installation of configuration B, starboard Cargo Basket installation. Installation of the cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL492, Rev. 1, dated 25 June 2002, or later approved revision. High skid gear is required with the basket installation. Placard required on basket lid.

Transport Canada approved Aero Design Ltd., Flight Manual Supplement FMS 492.01, Rev 1, dated 25 June 2002 is required with this installation.

The basis of certification for the Bell 206L series is as defined by the applicable Type Certificate Data Sheets, plus FAR 27 amendment 27-24.

.. END ..

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	0
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	0
49207	Cargo Basket Lid	0
49208	Cargo Basket Body	0
49209	End Hoop Assembly	0
49210	Basket Components - Hoops	0
49211	Basket Components - Rim	0
49212	Basket Components - Rim	0
49213	Basket Components - Lid Brace	0
49214	Basket Components - Spine	0
49215	Basket Components - Spacer	0
49216	Basket Components - Spacer	0
49217	Basket Components - Lug	0
49218	Placard	0
49221	Support Beams	0
36255	Handle Assembly	0
36261	Handle Bar Assembly	0
36262	Handle Bracket Assembly	0
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	0
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	0
36280	Brace	0
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report - Basket Installation	0
ER492.02	Engineering Report - Basket Load Tests	0
FMS492.01	Flight Manual Supplement	1

APPROVAL: <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <div style="display: inline-block; text-align: center;"> <small>Transport Canada</small> </div> <div style="display: inline-block; text-align: center;"> <small>Transports Canada</small> </div> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> AIRCRAFT CERTIFICATION DIVISION <div style="text-align: center; font-weight: bold; font-size: 1.2em;">APPROVED</div> By <u>D. S. Austin</u> App'l No. <u>SH00-48</u> App'l Date <u>00-12-08</u> Issue No. <u>2</u> Issue Date <u>02-06-27</u> <small>YY-MM-DD</small> </div>	ORIGINAL DATE: 17 May, 2002 REVISION DATE: 25 June, 2002	<div style="font-weight: bold; font-size: 1.2em;">AERO DESIGN LTD.</div> 1045 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333
SHEET 1 OF 1	<div style="font-weight: bold;">BELL 206L SERIES</div> <div style="font-weight: bold;">Side-Mounted Cargo Basket Installation</div>	
DCL492		Rev. <div style="font-size: 2em; font-weight: bold;">1</div>

AERO DESIGN LTD.

FMS492.01

BELL 206L SERIES

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN CARGO BASKET

Supplemental Type Certificate No. SH00-48, Issue 2

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206L when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u>D. S. Austin</u>		
App'l No. <u>SH00-48</u>		
App'l Date <u>00-12-08</u>		
Issue No. <u>2</u>		
Issue Date <u>02-06-27</u>		
YY-MM-DD		

Revision 1
25 June, 2002

Page 1
TRANSPORT CANADA APPROVED

AERO DESIGN LTD.

FMS492.01

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4

Revision 1
25 June, 2002

Page 2
TRANSPORT CANADA APPROVED

AERO DESIGN LTD.

FMS492.01

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (90,9 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 350 fpm.

Cruise speeds are reduced by approximately 10 mph.

Revision 1
25 June, 2002

Page 3
TRANSPORT CANADA APPROVED

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90,9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49301	External Attachment Provisions Installation	1
FABRICATION DOCUMENTS		
49311	Forward Fitting	0
49312	Aft Fitting	0
49311	Forward Fitting	1
49312	Aft Fitting	1
49319	Washer	0
49320	Barrel Nut	0
49320	Barrel Nut	1
49321	Spacer	0
ENGINEERING DOCUMENTS		
ER493.01	Engineering Report	0
FMS493.01	Flight Manual Supplement	0
ER493.03	Test Report	0
261.02	Honeycomb Insert Load Test Report	0
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>APPROVAL:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <div style="text-align: right;"> <p>APPROVED</p> <p>By: <i>D. S. Austen</i></p> <p>Appr'l No. <u>SH00-48</u></p> <p>Appr'l Date <u>00-12-08</u></p> <p>Issue No. <u>2</u></p> <p>Issue Date <u>02-06-27</u></p> <p style="text-align: center; font-size: small;">YY-MM-DD</p> </div> </div> </div> <div style="width: 35%;"> <p>ORIGINAL DATE: 19 May, 2002</p> <p>REVISION DATE: 25 June, 2002</p> </div> <div style="width: 30%; text-align: center;"> <p>AERO DESIGN LTD.</p> <p>1045 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333</p> </div> </div>		
SHEET 1 OF 1		BELL 206L SERIES External Attachment Provisions
DCL493		Rev. 2

AERO DESIGN LTD.

FMS493.01

BELL 206L SERIES

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of EXTERNAL ATTACHMENT PROVISIONS

Supplemental Type Certificate No. SH00-48, Issue 2

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206L Series when fitted with External Attachment Provisions. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By	<i>D. S. Austin</i>	
App'l No.	SH00-48	
App'l Date	00-12-08	
Issue No.	2	
Issue Date	02-06-27	
YY-MM-DD		

Revision 0
19 May, 2002

TRANSPORT CANADA APPROVED

AERO DESIGN LTD.**FMS493.01****I LIMITATIONS**

1. Attachment of any equipment to the External Attachment Provisions requires Transport Canada Approval.

II NORMAL PROCEDURES

1. No change from basic Approved Flight Manual.

III EMERGENCY PROCEDURES

1. No change from basic Approved Flight Manual.

IV PERFORMANCE

1. No change from basic Approved Flight Manual.

Revision 0
19 May, 2002

TRANSPORT CANADA APPROVED

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
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CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

FAX @

Steve

I have removed TC approved

AERO DESIGN LTD.

FMS492.01

V WEIGHT AND BALANCE

from W&B data

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
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Cargo	90,9 (MAX)	2898	263 457	978	88 900

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CAUTION:

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This is normally not approved section which is consistent with the first page. Please update your computer copies.



Government
of Canada

Gouvernement
du Canada

ACTION
REQUEST

FICHE DE
SERVICE

To - A

Aero Design Ltd
- Steve

Date 2002 JUNE 26

Time - Heure 8:07 pm

From - De

Jack Staal

Language spoken - Langue utilisée

☐ English
Anglais

☐ French
Français

Telephone - Téléphone

Extension
Passe

☐ Please call
Prière d'appeler

☐ Returned your call
Vous a rappelé

☐ Will call again
Va se rappeler

☐ Wants to see you
Désire vous voir

☐ Action
Donner suite

☐ Approva.
Approbation

☐ Note and return
Noter et renvoyer

☐ Comments
Commentaires

☐ Draft reply
Projet de réponse

☐ Note and forward
Noter et faire suivre

☒ As requested
Comme demandé

☐ Signature

☐ Note and file
Noter et classer

File No. - N° de dossier

SH00-48 1552

Message taken by - Message reçu par

Steve attached is
Draft STC.

- comments? JP.



GC 12 (91.01)

7540-21-868-3907

not for release



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, ALBERTA
T2E 7G9 CANADA

Number: SH00-48

Issue No.: 2

Approval Date: December 8, 2000

Issue Date: June 26, 2002

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206L, 206L 1, 206L 3, 206L 4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of an Aero Design Ltd right hand cargo basket/external attachment provisions.

Installation/Operating Data,

Required Equipment and Limitations:

Bell 407 only:

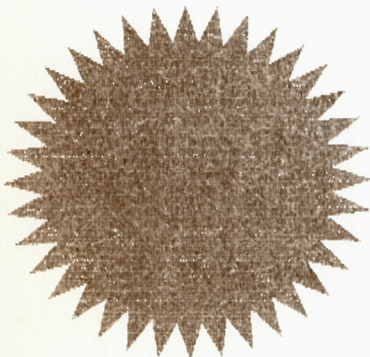
Installation of Aero Design Ltd starboard cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 362, Rev. 2, dated 23 November 2000, or later approved revision.

Transport Canada approved Aero Design Ltd. Flight Manual Supplement FMS 362.01 Revision 1, dated 14 November 2000 is required with this installation.

Aero Design Ltd Maintenance Manual Supplement MMS 362.01, Revision 0, dated 15 November 2000 is required with this installation.

Applicable placard required in the basket lid in accordance with installation drawing 36201.

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

*Draft*

D.S. Austen
For Minister of Transport

Canada

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN

~~Draft~~

Installation/Operating Data, Required Equipment and Limitations (continued):

Bell 206L, L-1, L-3, L-4, only:**Configuration A - External Attachment Provisions only:**

Installation of the External Attachment Provisions is to be completed in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 493, Rev. 2, dated 25 June 2002 or later approved revision.

Transport Canada approved Aero Design Ltd., Flight Manual Supplement FMS 493.01, dated 19 May 2002, is required with this installation.

Configuration B - Starboard Cargo Basket installation:

Installation of configuration A, External Attachment Provisions is a prerequisite for installation of configuration B, starboard Cargo Basket installation. Installation of the cargo basket is to be done in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL 492, Rev. 1, dated 25 June 2002, or later approved revision. High skid gear is required with the basket installation. Placard required on basket lid.

Transport Canada approved Aero Design Ltd., Flight Manual Supplement FMS 492.01, Rev. 1, dated 25 June 2002 is required with this installation.

The basis of certification for the Bell 206L series is as defined by the applicable TCDS, plus FAR 27 amendment 27-24.

--END--

~~Draft~~

PACKING SLIP

25 June, 2002

Address:

Taiga Helicopters Ltd.
155 West Hangar Rd.
Winnipeg, Manitoba
R3J 3Z1

(204) 943-3645

Attention:

Tony

Reference: Your Purchase Order:

Quantity Ordered	Quantity Shipped	Description	Part Number
1	1 ✓	200 Lb Cargo Basket Assembly	49205-01
1	1 ✓	Forward Support Beam	49221-01
1	1 ✓	Aft Support Beam	49221-02
2	2 ✓	Forward External Attachment Fitting	49311-01
2	2 ✓	Aft External Attachment Fitting	49312-01
4	4 ✓	Barrel Nut	49320-01
2	2 ✓	Semi-circular Washers	49319-01
4	4 ✓	Spacers	49321-01
5	5 ✓	Bolt	AN4-24A
10	10 ✓	Washer	AN960JD416
5	5 ✓	Nut	MS21044N4
4	4 ✓	Bolt	AN6-17A
4	4 ✓	Washer	AN960JD606
1	1 ✓	Installation Drawing – Cargo Basket	49201
1	1 ✓	Installation Drawing – Fittings	49301
1	1 ✓	Service Bulletin – Spacer	SB49312.01
1	1 ✓	MAINT - INST	MI 492.01

AERO Design Ltd.

**MAINTENANCE INSTRUCTIONS
MI 492.01**

External Cargo Basket

Bell 206L Series

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Date: 19 June, 2002
Revision 0

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodesign@telusplanet.net

NOTICE: This manual contains information and data which is proprietary to AERO DESIGN LTD. This manual, or any portion thereof, may not be reproduced, copied, duplicated or used without the written consent of AERO DESIGN LTD.

1.0 INTRODUCTION

The External Cargo Baskets mount on the left and/or right side of the helicopter, using replacement brackets for the skid gear cross tubes attachments. The basket is attached to a beam at the front and aft end, which are attached to the new cross tube brackets.

2.0 REFERENCE

AC43.13-1B

3.0 INSPECTION PROCEDURES

3.1 Basket

- Visually inspect tube to tube welds and mesh to tube welds every 100 hours for cracks, defects or other damage.
- Visually inspect basket mesh for damage every 100 hours.

3.2 Beams

- Visually inspect beams attaching basket to the helicopter every 100 hours for cracks, defects or other damage.
- Visually inspect bolt and spacers (where applicable) attaching the basket to the beams every 100 hours for damage.
- Visually inspect bolts attaching beams to cross tube attachment bracket every 100 hours for damage.

3.3 Landing Gear Attachment Fittings

- Visually inspect brackets every 100 hours for cracks, defects or other damage.
- Visually inspect bolts attaching top half of bracket to bottom half of bracket every 100 hours for damage.

4.0 REPAIR PROCEDURES

4.1 Basket

Basket is fabricated from the following materials:

Lid and Rim:	3/4" x 0.035" square 4130 steel tube
Frames:	1/2" x 0.035" square 4130 steel tube
Mesh:	3/4" 18 ga. (0.040") expanded carbon steel

Repair in accordance with AC43.13-1B, Chapter 4, as required.

4.2 Beams

DO NOT REPAIR MAJOR DAMAGE TO BEAMS. Replace beam if major damage is found.

- (a) Nicks and/or gouges on the top or bottom face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- (c) Nicks on the corners up to 0.125" deep may be dressed out.
- (d) For elongation of basket attachment holes (AN4 bolt):
 - 1. Ream hole to 0.375 (+0.0005)
 - 2. Insert NAS76A4-100 bushing
- (e) For elongation of helicopter attachment holes (AN6 bolt):
 - 1. Ream hole to 0.5000 (+0.0005)
 - 2. Insert NAS76A6-100 bushing

4.3 Landing Gear Attachment Fittings

DO NOT REPAIR MAJOR DAMAGE TO BRACKETS. Replace brackets if major damage is found.

- (a) Nicks and/or gouges on any face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- (b) For elongation of basket beam bolt hole (AN6 bolt):
 - 1. Do not repair

BELL 206L SERIES

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN CARGO BASKET**

Supplemental Type Certificate No. SH00-48, Issue 3

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206L when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (94 kg).
2. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 350 fpm.

Cruise speeds are reduced by approximately 10 knots.

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90,9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations. For example, with one pilot, no passengers, fuel tanks half empty, and the AERO Design Ltd. cargo basket loaded with 200 pounds of cargo, the Lateral CG of the rotorcraft could be out of limits.

AERO DESIGN LTD.

1045 McTavish Rd. N.E.
Calgary, Alberta
T2E 7G9

21 June, 2002

Transport Canada
Aircraft Certification Division
Edmonton Aircraft Certification Office
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Mr. Jack Staal

Re: Installation of Cargo Basket on Bell 206L STC

Out file: 493
Your file: SH00-48

Jack:

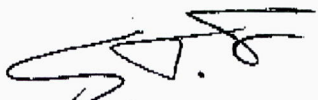
We have performed a load test on a sample specimen of the fitting. The test substantiates the reduction of the thickness of the upper flange of the fitting to the thickness of the original Bell parts (from 0.40 to 0.25 for the forward fitting, from 0.50 to 0.31 for the aft). The spotface no longer is necessary. To maintain compatibility with the first batch of fittings we made, the drawings of the original fittings are included on the DCL as approved drawings (they already are approved on the LSTC, anyway). Also included with this package is an AE100 form and a signed CP. Ted has already signed off on all delegated items.

AE100 Form	AE493.03	Rev. 0	✓
Compliance Program	CP493	Rev. 2	✓
Document Control List	DCL493	Rev. 1	✓
Engineering Report	ER493.03	Rev. 0	✓

Concerning the basket itself, the drawing list needs no changing, but I've included the copy Ted has stamped. Ted has signed off the items in his delegation on the CP.

Document Control List	DCL492	Rev. 0	✓
AE100 Form	AE492	Rev. 0	✓
Compliance Program	CP492	Rev. 0	✓

Regards,



S. Fahey, Technologist

Ted/Steve June 25th

DCL 493 { - items marked X I don't have - FMS I used for LSTC.

DCL 492 { I have everything for this DCL.

DOCUMENT CONTROL LIST

[illegible]

Staal, Jack

From: Massicotte, Serge
Sent: 2002 June 20 10:42 AM
To: Staal, Jack
Cc: Maunula, Daniel
Subject: 206L Cargo Basket - Flight Test Report

Jack, attached is my report for subject testing. I included a recommendation for a placard on/near the basket stating its max load of 200 lbs (can't recall if there was one or not). Give me a call if you have any questions. I won't be in tomorrow however I'll be in Edmonton next week (TC Audit Course) if you need to reach me. I'll also forward the original Statement of Compliance/Conformity form to you via snail mail. I can fax you a copy if you want it now.

Regards,

Serge Massicotte
Engineering Test Pilot
Aircraft Certification
(613) 941-6212



206L Basket -
Report.doc

20 June 2002

Flight Test Report

AERO Design Ltd. Cargo Basket WiskAir Helicopters - Bell 206L

PURPOSE

1. Flight-testing was required to certify the Bell 206L helicopter for operations with the AERO Design Side-Mounted Cargo Basket. This regional project was conducted at the Thunder Bay airport in support of the Northern and Prairie Region (Edmonton Office).

TEST AIRCRAFT

2. Details of the test aircraft are as follow:

- a) Aircraft Type/Model: Bell 206 / Model L
- b) Aircraft Registration/Serial No.: C-FBHM, s/n 45066
- c) Original basis of certification: CAR 6 dated December 20, 1956, Amendments 6-1 through 6-4 plus additions of FAR 27 for the 206L-3 and 206L-4 (as per Type Certificate Data Sheet Number H-92 Issue 16)
- d) Test Configuration: Configuration was standard for type.
- e) Installed engine type: Allison 250-C20R/2
- f) Basic max. approved weight: 4000 lbs
- g) Weight applied for: Same as basic aircraft
- h) CG Range: See RFM
- i) Proposed CG change with the modification: Same as basic aircraft
- j) Was aircraft weighed after modification: NO
- k) Were cockpit instruments recently calibrated: NO

3. A Flight Permit was issued by Transport Canada on 17 Jun 2002 and is valid for 30 days. The following personnel were involved: Serge Massicotte (TC/AARDC), Daniel Maunula (TC, Thunder Bay Office), Jack Staal (TC, Edmonton Office) Ted Burgoin (AERO Design Ltd., Calgary) and Mark Wiskemann (WiskAir Helicopters pilot).

TEST CONDITIONS

4. The subject aircraft was test flown by Serge Massicotte from Transport Canada on 17 June 2002. Three flights were flown in day -VFR conditions to compare the three possible configurations as follow:

- A - Basket installed/loaded with 200 lbs, 3513.4 lbs, 120.3 Long and 2.45 Lat CG
- B - Basket installed/empty, 3313.4 lbs, 124.8 Long and 0.27 Lat CG

Transport Canada
Aircraft Certification

C - Basket removed

3454.4 lbs, 120.6 Long and -0.19 Lat CG

5. Outside air temperature remained around +19° C at a field elevation of 653 ft (Thunder Bay airport).

DISCUSSION

6. The modified aircraft was examined against the requirements of Canadian Airworthiness Manual Chap 527 / FAR 27. Flight-testing determined that the Bell 206L with subject cargo basket installed complied with the AWM/FAR flight requirements for an absolute Vne of 150 mph (115 mph for power-off conditions).

7. General Handling Characteristics - The test aircraft was flown in all three configurations and exhibited very similar flying characteristics. No differences in handling qualities were noticed throughout the applicable speed range (up to 1.1 Vne).

8. Autorotation - Autorotations were conducted from cruise at speeds up to 1.1 Vne for power-off conditions, with and without the cargo basket installed. Normal flight characteristics were observed in all three configurations.

9. Aircraft Performance - Climbs were conducted at 60 mph and 88% Q in configurations A and C of paragraph 4. Testing indicated that with the basket installed and loaded with 200 lbs of equipment, climb rate was reduced by approximately 350 fpm. A reduction in Vh of approximately 10 mph was also recorded with the basket installed.

10. Position Error Calibration - No calibration flight was conducted based on the positions of the pitot tube and static port that are both in areas unaffected by the side-mounted cargo basket.

11. Dynamic Component Loads - The FAA technique to ensure that the modified aircraft Vne is low enough to alleviate concerns about dynamic component loads was used with satisfactory results. Longitudinal cyclic position remained approximately the same at Vne.

12. Other Observations - Subject modification has no effect on external lighting efficiency and pilot field of view. Ground clearance for the cargo basket is about 13 inches and does not present any concerns.

FLIGHT MANUAL SUPPLEMENT

13. The following information must be included in the Flight Manual Supplement:

Limitations:

When the cargo basket is installed, flight operations are limited to Day/Night VFR operations.

Transport Canada
Aircraft Certification

The maximum load in the basket is 200 lbs.

Normal Procedures:

Procedure for pre-flight inspection of the cargo basket installation must be included.

Performance:

Climb performance may be reduced by as much as 350 fpm.

Cruise speeds are reduced by approximately 10 mph.

Weight and Balance:

Must include pertinent loading information (weights/arms/moments) required for safe operation.

RECOMMENDATIONS

14. Based on subject flight testing, it is recommended that the AERO Design Ltd Cargo Basket installation be approved on the Bell 206L helicopters subject to the following limitations:

the aircraft is limited to Day/Night VFR operations;

the additions to the Flight Manual Supplement described in the "Flight Manual Supplement" section are incorporated;

a placard / markings stating the cargo basket maximum allowable load of 200 lbs must be readily visible to the operator.

Prepared by:
Serge Massicotte
Engineering Test Pilot
Transport Canada,
Aircraft Certification Branch
Ottawa
(613) 941-6212

AERO Design Ltd.
1045 McTavish Road NE
Calgary, AB, T2E 7G9
email: steve.aerodesign@telusplanet.net

FACSIMILE COVER PAGE

To: Jack Staal	From: Steven Fahey
Fax #: 17804957963	Fax #: (403) 250-8333
Company: Transport Canada	Tel #: (403) 250-8027
Subject: FW: from WiskAir	
Sent: 6/21/02 at 3:40:58 PM	Pages: 2 (including cover)

MESSAGE:

Company flight test report from WiskAir. Please send me a copy of the draft FMS, that we gave you last month, with the changes you want, based on the flight test results. We'll send you back a clean copy, with all the changes incorporated, for you to stamp.

Steve

Transport Canada Limited of Full STC
Simple External Modification - Applicant's Flight Test Report

Aircraft Type: Bell 206L

Reg. # / Serial #: C-FBHM / 45066

Date of Flight: June 17/02

Location of Flight: Thunder Bay

Takeoff Weight: 3008.6

Takeoff C of G: 126.2"

Modification Description: Installation of External Cargo Basket

Modification Drawing #: 49201

List all other external mods: External Attachment Provisions,

TEST RESULTS

	TEST	Characteristics to Look For:	Initial if Satisfactory
1	Low Speed Controllability	<ul style="list-style-type: none"> Precise Hovering Adequate control margins up to 20 MPH estimate airspeed sideward and rearward. 	MW. MW.
2	Airspeed Indications	<ul style="list-style-type: none"> Airspeed and altitude indication reliable and steady. Location of Modification not near pilot or static port: Yes <input type="radio"/> No <input checked="" type="radio"/> (Circle one) 	MW.
3	Forward Flight out to V _{NE}	<ul style="list-style-type: none"> Determine max. level flight airspeed at MCP. Control position (margins) and trim characteristics Conduct turns at V_{NE} both directions Vibrations Maximum speed flown: Note: V_{NE} will be 90% of maximum speed flown. 	132 mph normal MW. NIL 165 mph
4	Autorotation	<ul style="list-style-type: none"> Simulated sudden power failures building up from moderate speeds to V_{NE} and autorotation control V_{minROD} and V_{Neuro} 	115 mph To 40 mph
5	Climbing Flight	<ul style="list-style-type: none"> TOP and MCP, speed from V_Y - 10 kias to 1.3 V_Y Altitude airspeed and power control 	1500' / min normal
6	Takeoff and Landing	<ul style="list-style-type: none"> Effect on normal procedures and handling 	no change
7	Miscellaneous	<ul style="list-style-type: none"> System controls, displays and interface Effect on emergency and normal egress Flight Manual Supplement for special operating procedures and information If required, attach report 	no change no change on board M.W.

I hereby attest that I have flown Bell 206L, R/N C-FBHM, S/N 45066 with the above modifications installed and that this aircraft exhibited handling qualities and performance characteristics of a standard Bell 206L helicopter. Maximum speed attained was IAS. The speed was limited by basic rotorcraft limit / modification / other.

Pilot's Signature: 

Date: June 17/02

Pilot's Name: MARK WISKEMAN

Pilot's License #: D16085

(If applicable) DAR's Signature:

DAR's Name: E. Burgoin

Date:

DAR's Number: 290M

Aero Design

From: "Wisk-Air Helicopters" <info@wiskair.com>
To: "Aero Design" <aerodsgn@telusplanet.net>
Sent: Wednesday, June 19, 2002 7:51 AM
Attach: Alex Turner.vcf; EKM Daily W and B.xlt; BHM Daily W and B.xlt
Subject: Weight & Balance Worksheets



Good Morning Gentleman,

Attached you will find copies of the Weight & Balance Daily worksheets that we use to check load configuration. As you can see, they are pretty straight forward, you just enter your current empty W & B values based on the Temp Config. or Amendment that you are working under and then add and manipulate the values for your load. The graphs will update in real time, which really speeds up the process and ensures that you prepare a safe load. It is also very helpful for events like the test we just conducted because you can graphically see if you are achieving your desired target C of G.

For your purposes, you may want to tweak the fuel area a bit by adding more lines to the spreadsheet to better track fuel C of G distribution, but for our needs, Transport was more than happy with this system.

Hope you find it of some use.

Regards,

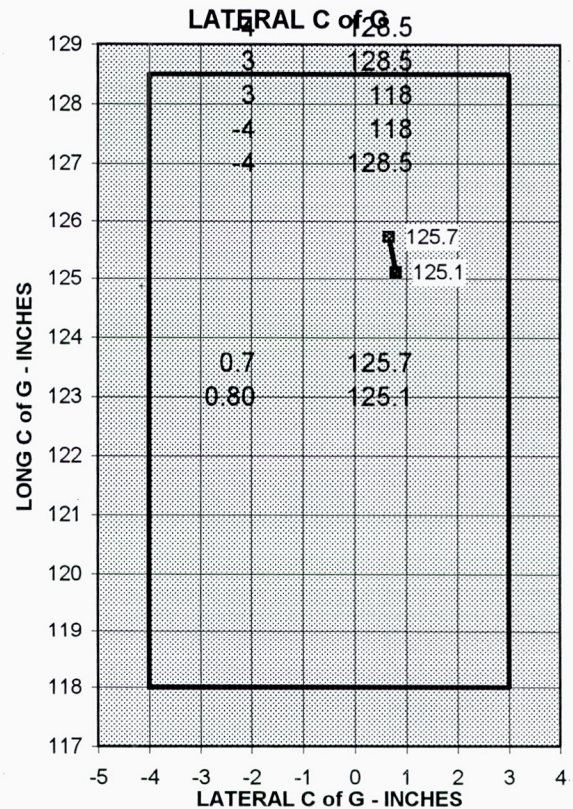
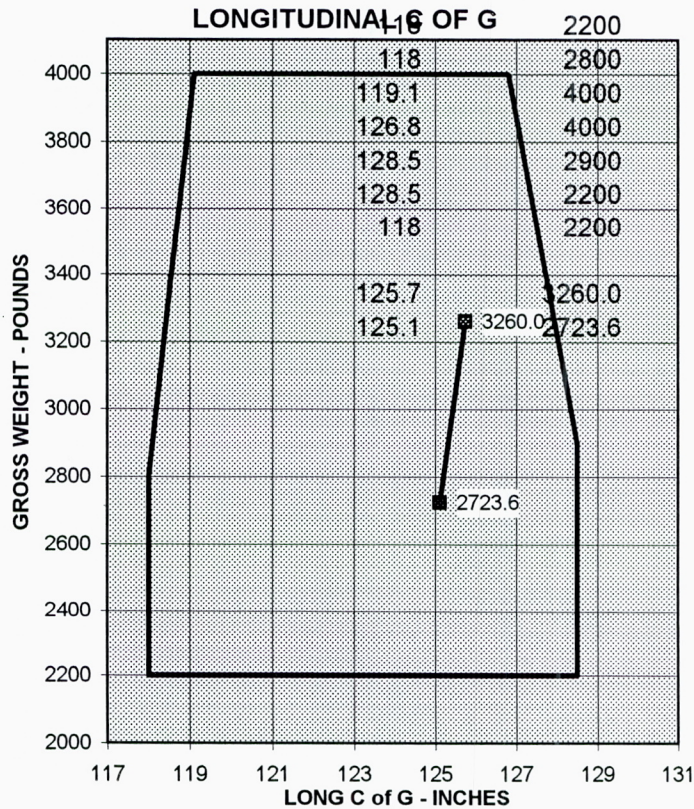
Alex Turner



Wisk Air Helicopters
304 Hector Dougall Way
Thunder Bay, Ontario, P7E 6M6
Phone: (807) 475-4510
Fax: (807) 473-5485
Web: www.wiskair.com Email: info@wiskair.com

**Wisk Air Helicopters
C-FBHM**

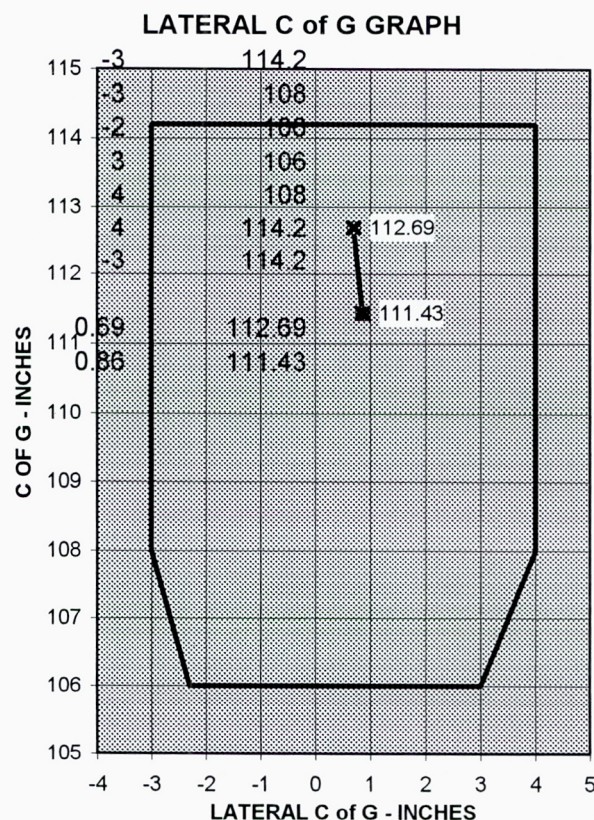
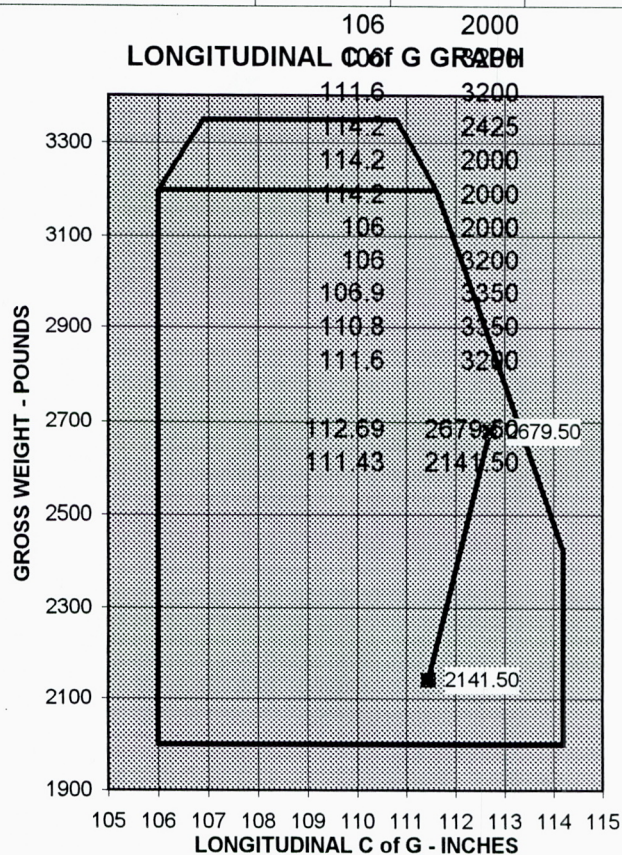
BELL 206L	WEIGHT	LONG ARM	MOMENT	LAT ARM	MOMENT
TAKE-OFF WITH MAXIMUM FUEL FOR THIS FLIGHT					
EMPTY	2430.6	128.98	313493.21	-0.14	-329.79
OIL	13.0	205.00	2665.00		
PILOT	180.0	65.00	11700.00	14.00	2520.00
FWD PAX	0.0	65.00	0.00	-11.00	0.00
LEFT MID PAX	0.0	91.00	0.00	-12.90	0.00
RIGHT MID PAX	0.0	91.00	0.00	12.90	0.00
LEFT AFT PAX	0.0	129.00	0.00	-15.80	0.00
CENTRE AFT PAX	0.0	129.00	0.00		
RIGHT AFT PAX	0.0	129.00	0.00	15.80	0.00
SLING LOAD	0.0	121.50	0.00		
BAGGAGE	0.0	174.00	0.00		
BASKET CARGO	0.0	104.00	0.00	38.50	0.00
FULL FUEL (636.4)	636.4	128.90	82031.96		0.00
TOTALS	3260.0	125.74	409890.17	0.67	2190.21
MAXIMUM WEIGHT	4000.0		% FUEL	100%	
OVER/UNDER MAX	740.1		TIME FUEL @ 34%/hr	2.7	



MINIMUM REQUIRED FUEL AT LANDING					
FULL FUEL (636.4)	100.0	128.90	12890.00	0.00	0.00
TOTALS	2723.6	125.11	340748.21	0.80	2190.21
MAXIMUM WEIGHT	4000.0		% FUEL	16%	
OVER/UNDER MAX	1276.5		TIME FUEL @ 34%/hr	0.4	

Wisk-Air Helicopters
C-GEKM

BELL 206	LBS	LONG	MOMENT		LATERAL	MOMENT
TAKE-OFF WITH MAXIMUM FUEL FOR THIS FLIGHT						
EMPTY	1869.20	115.19	215320.29		-0.36	-672.06
OIL	12.30	179.00	2201.70		0.00	0.00
PILOT	180.00	65.00	11700.00		14.00	2520.00
FWD PAX	0.00	65.00	0.00		-11.00	0.00
MID PAX	0.00	104.00	0.00		0.00	0.00
AFT PAX LEFT	0.00	104.00	0.00		-16.10	0.00
AFT PAX RIGHT	0.00	104.00	0.00		16.10	0.00
BAGGAGE	0.00	148.00	0.00		0.00	0.00
SLING LOAD	0.00	110.00	0.00		0.00	0.00
FUEL	618.00	117.70	72738.60		0.00	0.00
TOTALS	2679.50	112.69	301960.59		0.69	1847.94
MAXIMUM WEIGHT	3200.00		% FUEL	1.24		
OVER/UNDER MAX	520.50		ENDURANC	3.66		



MINIMUM REQUIRED FUEL AT LANDING						
FUEL	80.00	117.70	9416.00		0.00	0.00
TOTALS	2141.50	111.43	238637.99		0.86	1847.94
MAXIMUM WEIGHT	3200.00		% FUEL	0.16		
OVER/UNDER MAX	1058.50		ENDURANC	0.47		

FAX TRANSMITTAL

To: Steven
P.O. No: N.A.

Number of Pages: 1

QUOTATION REVISED

Quotation No.: 19627

Customer No.: 121

Date: Jun. 18, 02

CUSTOMER:

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, AB

T2E 7G9

Phone: (403) 250-8027
Cell:
Fax: (403) 250-8333

PART DESCRIPTION AND PRICE:

Item No.	Part description	Unit Price	No. of Units	Total Price
1	Plates #49221-02 AFT Mounting beam	\$59.17	4	\$236.68
2	Plates #49221-01 Forward Mounting beam	\$60.86	4	\$243.44
		Total		\$480.12

Received and approved by: STF

Please initial and return with purchase order to authorize job to proceed.

SCOPE:

DESIGN:	Design, drawing and computer file (DXF or otherwise) supplied by Aero Design Ltd.	
	Creation of the computer drawing/file.	Included
PROGRAMMING:	Laser or Water Jet machine programming.	Included
PREPRODUCTION:	Production set up.	Included
MATERIAL:	1.0 Alum Flat Bar. Supplied by Aero Design Ltd.	Not Included
PROCESSING:	Water Jet cutting (Tolerance up to 1" \pm .010 & 1" & over \pm .020) or as stated by LEI.	Included
G.S.T.	Extra	Not included
DELIVERY:	Quotation based on customer pickup of parts at LEI's Shop.	Not included

TERMS AND CONDITIONS:

COMPLETION: Four (4) days after receipt of order, detailed drawing, computer file (DXF or otherwise) or material, whichever occurs last. **(Delivery dates are only approximate.)**

GENERAL: Standard terms and conditions apply.

To check on status of your order please call Lori Lee @ (403) 250-2576

Submitted by: _____
Graham Park



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
1055 McTavish Rd. N.E.
Calgary
Alberta T2E-7G9

Approval Number: SH00-48

Issue Number: 1

Date of Approval: 2000 December 08

Date of Issue: 2000 December 08

Responsible Office: Prairie and Northern

Aircraft/Engine Type/Model: Bell 407

Canadian Type Certificate or
Equivalent: H-92, H2SW

Description of Design Change: Installation of a Aero Design Ltd right hand cargo basket.

Installation/Operating Data, Required Equipment and Limitations: Installation of Aero Design starboard cargo basket is to be done in accordance with Transport Canada approved Aero Design Ltd, Document Control List DCL 362 Rev 2, dated 23 November 2000.

Transport Canada approved Aero Design Ltd Flight Manual Supplement FMS362.01, Rev 1, dated 14 November 2000 is required with this installation.

Aero Design Ltd. Maintenance Manual Supplement MMS362.01, Rev 0, dated 15 November 2000 is required with this installation.

Applicable placard required on the basket lid in accordance with installation drawing 36201.

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.



F.J.B. Wright

For Minister of Transport

FWD BEAM

MOST I.B. 26 $\frac{3}{8}$ "

BRACKET VARIANCE

MOST O.B. 26 $\frac{27}{32}$ "

AFR BEAM.

MOST. I.B. 20 $\frac{9}{32}$ "

MOST O.B. 20 $\frac{3}{4}$ "



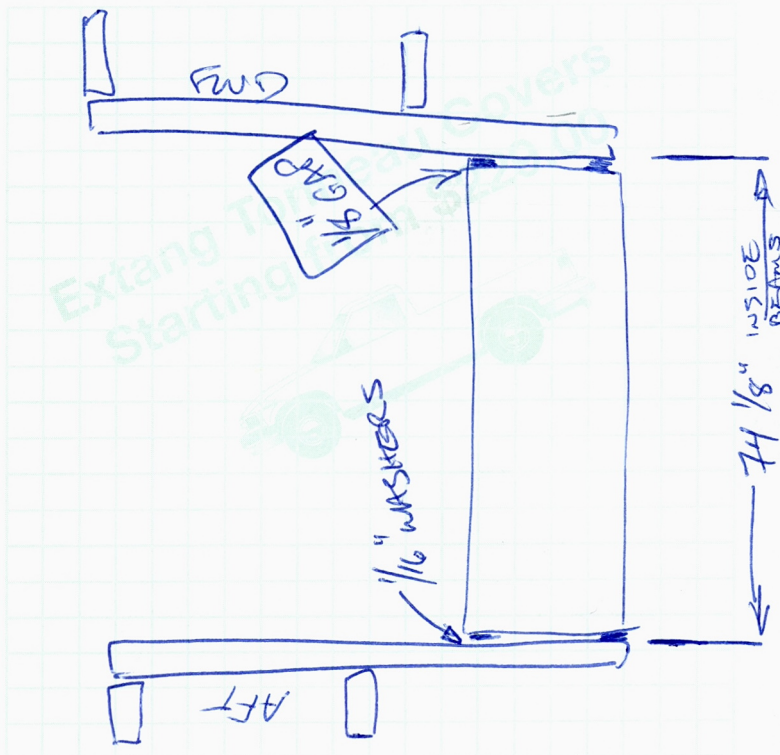
APPLE Auto Glass®



RECYCLING REDUCES WASTE,
AND PROTECTS RESOURCES.

Locally Owned and Operated

**Auto Upholstery • Sunroofs • Windshields
Truck, Van & Sport Utility Accessories**



CALGARY
CALGARY
CALGARY
CALGARY

4101 Macleod Trail South
15016 Bannister Rd. S.E., #8
3420-12th St. N.E., #112
11540 24th St. S.E., Bay #106
(Douglas Square at Deerfoot)

287-2064
254-0990
250-1581
203-0339

***Mobile service at no extra charge
Out of town customers call collect***



APPLE AutoGlass®



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AND PROTECTS RESOURCES.

Locally Owned and Operated

**Auto Upholstery • Sunroofs • Windshields
Truck, Van & Sport Utility Accessories**

SHORTEN BRAE
BY 3/4" TO
MISS DOOR

CALGARY
CALGARY
CALGARY
CALGARY

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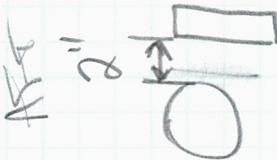
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A hand-drawn sketch of a building layout, oriented vertically. The sketch includes several rectangular shapes representing rooms or sections. Dimensions are written in various locations: 74 at the top right, $73\frac{1}{4}$ in the middle right, $73\frac{3}{4}$ in the middle left, and 10 at the bottom right. Arrows indicate directions or measurements. Labels include $3/8$ and $0''$ on the left side, and FOF (Facing Off) below them. The sketch is drawn with simple lines and includes some shading to indicate depth.



EMPLOYEE REQUEST FOR LEAVE

Please fill out and submit to your supervisor for approval, at the earliest opportunity. All Holidays must be taken in the year they are awarded, unless prior arrangements have been made. Requests for leave will be approved on a first come, first served basis.

NAME: _____ START DATE: _____
(month/year)

First Day Off: _____

Expected Day of Return: _____

Statutory Holidays (if any): _____

Available Holidays: _____

Holidays to be Used: _____

Holidays Remaining: _____

Additional Days Requested in Excess of Available Holidays: _____
(Time Off, No Pay)

(Employee Signature)

(Supervisor's Signature)

☐ Approved ☐ Declined

(Comments) _____

F.T. OKAY

FLIGHT TESTS DONE 17 JUNE

4 FLTS

① @ NOON 30 mins EMPTY
150 KTS (MPH)
1500 FPM
~ 300 LB

② @ T.C. 200 LB IN BASKET - FWD
132 AFT FACING SEAT
PILOT + CO
40 LB IN BGG. COMP.
1 HOUR

1000 - 1100 FPM
165 MPH
SIDE + REAR 20 KNOTS

STICK POSITS MATCH FAIRLY WELL
CRUISE 120 MPH

③ @ T.C. EMPTY BASKET
CRUISE 132 MPH

④ NO BASKET
100 - 150 FPM BETTER THAN ~~LOADING~~ ^{LOADING}

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 17, 2002

TIME: 12:30 PM

TO: Ideal Metals

PHONE: 250-2866

Christine

FAX: 250-9894

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet:

2

RE: ORDER FOR 6061-T6 3"X1" BAR

Please deliver two 20' lengths of 3" x 1" 6061-T6 bar to Laser Equations:

#10-1236 – 38th Avenue N.E.

Payment on our account (Aero Design Ltd.)

Please fax MTR's (Material Test Reports) to us, 250-8333.

Purchase Order # 2015

Steve

AERO Design Ltd.

1045 McTavish Rd. N.E.

Calgary, Alberta

T2E 7G9

Purchase Order

DATE	P.O. NO.
6/17/2002	2015

Vendor
Integris Metals Ltd. 4375-14th Street NE Calgary, Alberta T2E 7A9

Ship To
AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, Alberta T2E 7G9

ITEM	DESCRIPTION	QTY	RATE	AMOUNT
Bar, Aluminum	6061-T651, Aluminum Bar, QQ-A-225/8, 3" X 1"		0.00	0.00
	Total GST			0.00
			Total	\$0.00



wiskair

H E L I C O P T E R S

304 Hector Dougall Way
Thunder Bay, Ontario
P7E 6M6

Telephone 807-475-4510
Toll Free 1-800-579-4510
Fax 807-473-5485
Email info@wiskair.com

Fax

To: Armand. From: Mark.
Fax: 403-250-7110 Pages: _____
Phone: _____ Date: _____
Re: _____ CC: _____

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

Armand. the picture shows the spring
Clamp system as showing

- we have the aircraft belly
fitting

- we need 2 sets of the
Spring assy's as outlined
in parts req. order.

Although I don't have an
assembly P/N for you.

* See 206L parts manual 32-99-00 pg 20
fig 32-4

304 Hector Dougall Way
Thunder Bay, Ontario
P7E 6M6

Telephone 807-475-4510
Toll Free 1-800-579-4510
Fax 807-473-5485
Email info@wiskair.com



wiskair

H E L I C O P T E R S

Parts Requisition Request Form

Requisition No: _____

Date: June 16/02

ITEM	QUAN.	P/N	DESCRIPTION	BY (Initial)	A/C or STOCK
1	4	WAS6605-14	bolt		
2	8	MS14145L3	nut		
3	16	NA\$1149F0332P	washer		
4	8	NA\$6603-16D	Bolt		
5	4	206-050-222-007	support assy		
6	4	206-050-223-001	Spacer		
7	8 8	LC:063G-1\$\$	Spring		
8	8 16	140-006-4	washer		

Administrative Use Only. Please Do Not Write in Shaded Areas.

Req. Approved By:	
Date:	
P.O. # Issued:	
Vendors:	
P.O. Date:	
Expected Delivery Date:	

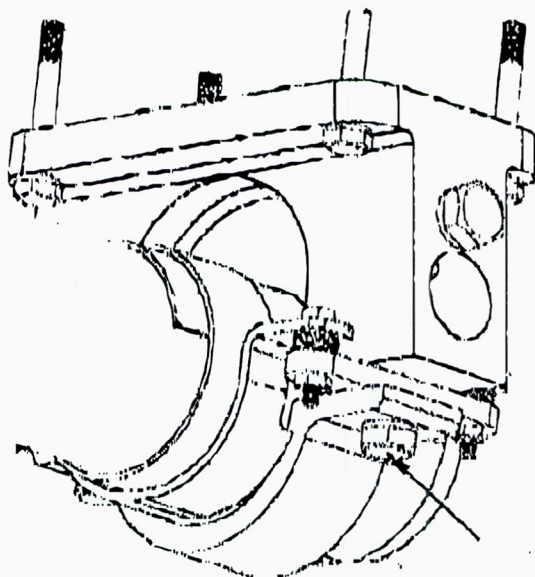
FROM :

PHONE No. : 00

JUN 13 2002 3:34PM P04

CHANGES

1. WHERE BOTTOM OF FITTING 49312-01 IS SPOTFACED INTERNALLY, USE ORIGINAL HARDWARE TO MOUNT LANDING GEAR CROSS TUBE.
 WHERE THE FITTING IS NOT SPOTFACED INTERNALLY, USE SEMI-CIRCULAR WASHER (49315-01) UNDER NUT.



USE EXISTING HARDWARE
 AND SEMI-CIRCULAR WASHER
 P/N 49315-01 AS REQUIRED
 TYPICAL 1 PLACE PER FITTING

(C3) AFT FITTING

ANG ROT ORIENTED FORWARD

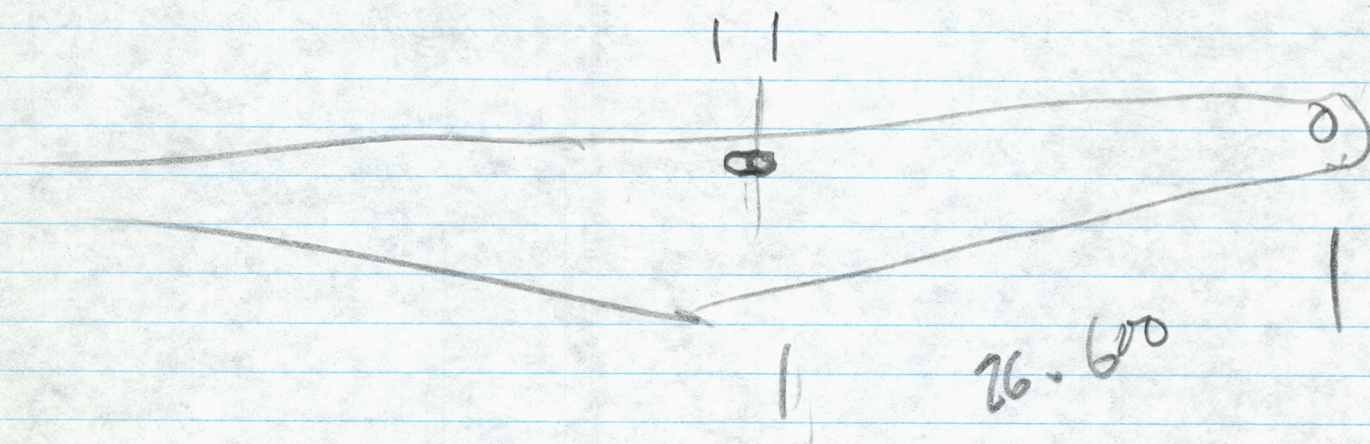
TYPICAL LEFT AND RIGHT

APPROVALS		DATE		AERO DESIGN LTD. ENGINEERING CONSULTANTS 1048 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7C8			
DRAWN: STEVEN FAHEY		JUN 06/02					
CHECKED: C. BURCOIN		JUN 06/02					
BY: []		[]		DRAWING CHANGE NOTICE The changes indicated are applicable to the initial issue and/or to previous Drawing Change Notices for this drawing and supersede the information from the initial issue of the drawing and/or any earlier Drawing Change Notices. This Drawing Change Notice must accompany the drawing if applies to at all times.			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1							
SCALE 1 : 1		Dwg. SIZE A4		Dwg. NO. 49301		REV. 0	
SHEET 1 OF 1						Dwg. A	

SERVICES
HOLE IN -

SB 99221-01

★
FWD BEAM



SLOT HOLE TO INCREASE
DIST BETWEEN HOLES

BOLT CENTRES
26 ²³/₃₂

26.600 to 26.719

REASON:

- 13.23

DATA 26.6

OBSERVE SOME DEL
TEMPERATURE AT.

LID BLOCKS DOOR

BRACE - TOP ATTACH - $\frac{1}{8}$ " IN THE WAY

ANOTHER PROB.

AIR CANADA

8001B 21ST NE

CALGARY

AB

ID: YYCFFCP1

STORE: 5383146

SLIP #: 0827

INV #: 07698386

SALE

\$60.66

SIGNATURE X

M/C 5191230043830755

0103

*S

SEQ 585001001002 AUTH 150005 ISO -001

APPROVED

DATE Jun 16 2002

TIME 1:00 PM

014 YYC 07698386

ORIGINAL

BOOKED FRT

014-07698386

Shipper's name and address
Nom et adresse de l'expéditeur
CASH
ONLYShipper's Account Number
N° de compte de l'expéditeur**AERO DESIGN LTD**
1045 MCTAVISH ROAD NE
CALGARY ABNOT NEGOTIABLE
AIR WAYBILL (AIR CONSIGNMENT NOTE)NON NÉGOCIABLE
LETTRÉ DE TRANSPORT AÉRIENISSUED BY
ÉMISE PAR
P.O. CANADA**P.O. BOX 14000, MONTREAL CA H4Y 1H4**Copies 1, 2 and 3 of this Air Waybill are
originaux et ont la même validitéLes exemplaires 1, 2 et 3 de cette lettre de transport
sont originaux et ont la même validitéConsignee's name and address
Nom et adresse du destinataireConsignee's account number
N° de compte du destinataire**WISK AIR**
807-475-4510 OR 768-7310
THUNDER BAY ONT

It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted) for carriage SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. THE SHIPPER'S ATTENTION IS DRAWN TO THE NOTICE CONCERNING CARRIERS' LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental charge if required.

Il est convenu que les marchandises décrites dans le présent document sont acceptées pour le transport en bon état apparent (sauf annotation contraire) et que le transport est SOUMIS AUX CONDITIONS DU CONTRAT QUI FIGURENT AU VERSO. L'ATTENTION DE L'EXPÉDITEUR EST ATTIRÉE SUR L'AVIS CONCERNANT LA LIMITATION DE RESPONSABILITÉ DU TRANSPORTEUR. L'expéditeur peut augmenter cette limitation de responsabilité en déclarant une valeur pour le transport plus élevée et en payant des frais supplémentaires s'il y a lieu.

Issuing carrier's agent, name and city
Nom et ville de l'agent du transporteur émetteurAccounting Information
Renseignements comptablesAgent's IATA code
Code IATA de l'agentAccount no.
N° de compteAirport of departure (address of first carrier) and requested routing
Aéroport de départ (adresse du 1^{er} transporteur) et itinéraire demandé**CALGARY**

To - A Routing and destination - Itinéraire et destination

To - A

By - Per

To - A

By - Per

YYZ ACBy first carrier - Per 1^{er} transporteur**YQT AC****W 06391 P 06391 C 06391 D 06391**Currency
MonnaieCgs
code
fraisWt / Val
Poids / valOther
AutrePPD
payéCol
d0PPD
payéCol
d0Declared value for carriage
Valeur déclarée au départDeclared value for customs
Valeur déclarée pour la douane**CAD PFX****XX****N V D**Airport of destination
Aéroport de destinationFlight/Date
Vol/date

For Carrier Use only - Réservé au transporteur

Flight/Date
Vol/date**THUNDER BAY****AC1134/16AC501/17****X**INSURANCE - If Carrier offers insurance, and such insurance is requested in accordance with conditions on reverse hereof, indicate amount to be insured in figures in box marked 'amount of insurance'.
ASSURANCE - Si le transporteur offre une assurance que l'expéditeur veut contracter conformément aux conditions décrites au verso, indiquer le montant à assurer, en chiffres, dans la case ci-contre.Handling information
Précisions sur le traitement de l'expédition**SCT HOLD FOR PICK UP**

SCI

No. of Pieces Nombre de colis RCP	Gross weight Poids brut kg lb	Rate Class - Classif. du tarif Commodity item no. Référence de l'article	Chargeable weight Poids de taxation	Rate / Charge Tarif / Montant	Total	Nature and quantity of goods (incl. dimensions or volume) Nature et quantité des marchandises (avec dimensions ou volume)
1	.5KGSCT		1.0	67.00	67.00	PARTS - NON HAZ
1	.5KG				67.00	GST NO: R100092287
Prepaid - Port payé		Weight Charge - Taxation au poids		Collect - Port d0		Other Charges - Autres frais
67.00						MYC .03/SCC 5.00/GTOC 5.28/
Valuation charge - Taxation à la valeur						NSOC 3.35/
Tax - Taxe						
Total other Charges Due Agent - Total des autres frais dus à l'agent						
Total other Charges Due Carrier - Total des autres frais dus au transporteur						
C	13.66					
Total prepaid - Total port payé		Total collect - Total port d0				
P	80.66					
Currency Conversion Rates Taux de conversion monnaie		cc charges in Dest. Currency Port d0 en monnaie du pays de destination				
For Carrier Use only at Destination Réservé au transporteur à destination		Charges at Destination - Frais à destination		Total collect Charges - Total d0		
Shipper certifies that the particulars on the face hereof are correct and that insofar as any part of the consignment contains dangerous goods, such part is properly described by name and is in proper condition for carriage by air according to the applicable Dangerous Goods Regulations. L'expéditeur certifie que les indications portées sur le présent document sont exactes et que, dans la mesure où une partie quelconque de l'expédition contient des marchandises dangereuses, cette partie d'expédition est correctement désignée et bien préparée pour le transport aérien, conformément à la Réglementation pour le transport des marchandises dangereuses applicable.						
Signature of Shipper or his Agent Signature de l'expéditeur ou de son agent						
JUN16 2002 CALGARY Executed on - Établie le (Date) At - A (Place Lieu) Signature of Issuing Carrier or its Agent Signature du transporteur émetteur ou de son agent						

014-07698386

16JUN02 18:59:15

ORIGINAL 3 (FOR SHIPPER - EXPÉDITEUR)

COPY - EX. 3

FOR AIRPORT OF DESTINATION (CUSTOMS MAIL - COORDONÉ DOUANE)

NOTICE CONCERNING CARRIERS' LIMITATION OF LIABILITY

IF THE CARRIAGE INVOLVES AN ULTIMATE DESTINATION OR STOP IN A COUNTRY OTHER THAN THE COUNTRY OF DEPARTURE, THE WARSAW CONVENTION MAY BE APPLICABLE AND THE CONVENTION GOVERNS AND IN MOST CASES LIMITS THE LIABILITY OF THE CARRIER IN RESPECT OF LOSS, DAMAGE OR DELAY TO CARGO TO 250 FRENCH GOLD FRANCS PER KILOGRAM, UNLESS A HIGHER VALUE IS DECLARED IN ADVANCE BY THE SHIPPER AND A SUPPLEMENTARY CHARGE PAID IF REQUIRED. THE LIABILITY LIMIT OF 250 FRENCH GOLD FRANCS PER KILOGRAM IS APPROXIMATELY US \$20.00 PER KILOGRAM ON THE BASIS OF US \$42.22 PER OUNCE OF GOLD. FOR TRANSPORTATION WHOLLY WITHIN CANADA A SHIPMENT SHALL HAVE A DECLARED VALUE OF \$1.10 PER KILOGRAM (BUT NOT LESS THAN \$50.00).

CONDITIONS OF CONTRACT

- As used in this contract, "Carrier" means all air carriers that carry or undertake to carry the goods hereunder or perform any other services incidental to such air carriage. "Warsaw Convention" means the Convention for the Unification of certain Rules relating to International Carriage by Air signed at Warsaw, 12 October 1929, or that Convention as amended at The Hague, 28 September 1955, whichever may be applicable, and "French gold franc" means francs consisting of 65½ milligrams of gold with a fineness of nine hundred thousandths.
- Carriage hereunder is subject to the rules relating to liability established by the Warsaw Convention unless such carriage is not "international carriage" as defined by that Convention.
 - To the extent not in conflict with the foregoing, carriage hereunder and other services performed by each Carrier are subject to:
 - applicable laws (including national laws implementing the Convention), government regulations, orders and requirements.
 - provisions herein set forth.
 - applicable tariffs, rules, conditions of carriage, regulations and timetables (but not the times of departure and arrival therein) of such carrier, which are made part hereof and which may be inspected at any of its offices and at airports from which it operates regular services. In transportation between a place in the United States or Canada and any place outside, thereof the applicable tariffs are the tariffs in force in those countries.
- The first Carrier's name may be abbreviated on the face hereof, the full name and its abbreviation being set forth in such Carrier's tariffs, conditions of carriage, regulations and timetables. The first Carrier's address is the airport of departure shown on the face hereof. The agreed stopping places (which may be altered by Carrier in case of necessity) are those places, except the place of departure and the place of destination, set forth on the face hereof or shown in Carrier's timetables as scheduled stopping places for the route. Carriage to be performed hereunder by several successive carriers is regarded as a single operation.
- Except as otherwise provided in Carrier's tariffs or conditions of carriage, in carriage to which the Warsaw Convention does not apply, Carrier's liability shall not exceed US \$20.00 or the equivalent per kilogramme of goods lost, damaged or delayed, unless a higher value is declared by the shipper and a supplementary charge paid.
- If the sum entered on the face of the Air Waybill as "Declared Value for Carriage" represents an amount in excess of the applicable limits of liability referred to in the above Notice, and in these Conditions, and if the shipper has paid any supplementary charge that may be required by the Carrier's tariffs, conditions of carriage or regulations, this shall constitute a special declaration of value, and in such case, Carrier's limit of liability shall be the sum so declared. Payment of claims shall be subject to proof of actual damages suffered.
- In cases of loss, damage or delay of part of the consignment, the weight to be taken into account in determining Carrier's limit of liability shall be only the weight of the package or packages concerned.

NOTE: Notwithstanding any other provision, for foreign air transportation as defined in the U.S. Federal Aviation Act, as amended, in case of loss or damage or delay of a shipment or part thereof, the weight to be used in determining the carrier's limit of liability shall be the weight which is used (or a pro rata share in the case of a part shipment loss, damage or delay) to determine the transportation charge for such shipment.
- Any exclusion or limitation of liability applicable to Carrier shall apply to and be for the benefit of Carrier's agents, servants and representatives and any person whose aircraft is used by Carrier for carriage and its agents, servants and representatives. For purposes of this provision Carrier acts herein as agent for all such persons.
- Carrier undertakes to complete the carriage hereunder with reasonable dispatch. Carrier may substitute alternate carriers or aircraft and may, without notice and with due regard to the interests of the shipper, substitute other means of transportation. Carrier is authorized to select the routing or to change or deviate from the routing shown on the face hereof. This Subparagraph is not applicable to/from USA.
 - Carrier undertakes to complete the carriage hereunder with reasonable dispatch. Except within USA where carrier tariffs will apply, Carrier may substitute alternate carriers or aircraft and may, without notice and with due regard to the interests of the shipper, substitute other means of transportation. Carrier is authorized to select the routing or to change or deviate from the routing shown on the face hereof. This Subparagraph is applicable only to/from USA.
- Subject to the conditions herein, the Carrier shall be liable for the goods during the period they are in its charge or the charge of its agent.
- Except when the Carrier has extended credit to the consignee without the written consent of the shipper, the shipper guarantees payment of all charges for carriage due in accordance with Carrier's tariffs, conditions of carriage and related regulations, subject to the application of national laws implementing the Convention, government regulations, orders and requirements.
 - When no part of the consignment is delivered, a claim with respect to such consignment will be entertained even though transportation charges thereon are unpaid.
- Notice of arrival of goods will be given promptly to the consignee or to the person indicated on the face hereof as the person to be notified. On arrival of the goods at the place of destination, subject to the acceptance of other instructions from the consignor prior to arrival of the goods at the place of destination, delivery will be made to, or in accordance with the instructions of the consignee. If the consignee declines to accept the goods or cannot be communicated with, disposition will be in accordance with instructions of the consignor.
- The person entitled to delivery must make a complaint to the Carrier in writing in the case:
 - of visible damage to the goods, immediately after discovery of the damage and at the latest within 14 days from receipt of the goods.
 - of other damage to the goods within 14 days from the date of receipt of the goods.
 - of delay, within 21 days of the date the goods are placed at his disposal.
 - of non-delivery of the goods, within 120 days from the date of the issue of the Air Waybill.
 - For the purpose of Subparagraph (a) above, complaint in writing may be made to the Carrier whose Air Waybill was used, or to the first Carrier or to the last Carrier, or to the Carrier who performed the transportation during which the loss, damage or delay took place.
 - Any rights to damages against Carrier shall be extinguished unless an action is brought within two years from the date of arrival at the destination, or from the date on which the aircraft ought to have arrived, or from the date on which the transportation stopped.
- The shipper shall comply with all applicable laws, and government regulations of any country to, from, through or over which the goods may be carried, including those relating to the packing, carriage or delivery of the goods, and shall furnish such information and attach such documents to this Air Waybill as may be necessary to comply with such laws and regulations. Carrier is not liable to the shipper for loss or expense due to the shipper's failure to comply with this provision.
- No agent, servant or representative of Carrier has authority to alter, modify or waive any provisions of this contract.
- On request and if the appropriate premium is paid and the fact recorded on the face hereof, the goods covered by this Air Waybill are insured under an open policy for the amount requested as set out on the face hereof (recovery being limited to the actual value of goods lost or damaged provided that such amount does not exceed the insured value). The insurance is subject to the terms, conditions and coverage (from which certain risks are excluded) of the open policy, which is available for inspection at an office of the issuing Carrier by the interested party. Claims under such policy must be reported immediately to an office of Carrier.

AVIS SUR LA LIMITE DE RESPONSABILITÉ DU TRANSPORTEUR

SI LE TRANSPORT COMPORTE UNE DESTINATION FINALE OU UNE ESCALE DANS UN PAYS AUTRE QUE CELUI DU POINT DE DÉPART, IL PEUT ÊTRE SOUMIS AUX CONDITIONS DE LA CONVENTION DE VARSOVIE. CETTE CONVENTION RÉGIT ET, DANS LA PLUPART DES CAS, LIMITE LA RESPONSABILITÉ DU TRANSPORTEUR EN CAS DE PERTE, AVARIE OU RETARD DE LA MARCHANDISE. A 250 F FRANÇAIS OR PAR KILOGRAMME, A MOINS QU'UNE VALEUR PLUS ÉLEVÉE N'AIT ÉTÉ DÉCLARÉE D'AVANCE PAR L'EXPÉDITEUR ET QU'UN SUPPLÉMENT ÉVENTUEL N'AIT ÉTÉ PAYÉ. CETTE LIMITATION DE RESPONSABILITÉ A 250 F FRANÇAIS OR CORRESPOND APPROXIMATIVEMENT À 20 \$ PAR KILOGRAMME SUR LA BASE DE 42,22 \$ US L'ONCE D'OR. SI LE TRANSPORT A LIEU UNIQUEMENT AU CANADA, LA VALEUR DÉCLARÉE DE L'ENVOI EST DE 1,10 \$ LE KILOGRAMME, AVEC UN MINIMUM DE 50 \$.

CONDITIONS DU CONTRAT

- Au sens du présent contrat, le mot "transporteur" désigne toutes les compagnies aériennes qui effectuent ou s'engagent à effectuer le transport des marchandises en vertu de la présente ou qui rendent tout autre service en relation avec ce transport. La Convention de Varsovie désigne la Convention pour l'unification de certaines règles relatives au transport aérien international, signée à Varsovie le 12 octobre 1929, ou cette même Convention telle qu'amendée à La Haye le 28 septembre 1955, selon que l'une ou l'autre est applicable, les "francs français" désignent les francs français constitués par 65½ milligrammes d'or au titre de 900 millièmes de fin.
- Le transport effectué en vertu des présentes conditions est soumis aux règles de responsabilité édictées par la Convention de Varsovie, sauf dans le cas où ce transport n'est pas un transport international au sens de cette Convention.
 - Dans la mesure compatible avec ce qui précède, le transport effectué et tous autres services rendus par chaque transporteur en vertu de cette lettre de transport sont régis par :
 - la législation applicable (y compris les lois nationales ratifiant la Convention), les décisions, instructions et règlements gouvernementaux.
 - les présentes conditions.
 - les conditions générales de transport, tarifs, règlements et horaires du transporteur (à l'exclusion des heures d'arrivée et de départ), qui sont réputées faire partie intégrante du contrat de transport et qui peuvent être consultés dans les bureaux du transporteur et aux aéroports où il exploite des services réguliers. Pour les transports effectués entre un point aux États-Unis ou au Canada et tout autre lieu, les tarifs applicables sont les tarifs en vigueur dans ces pays.
- Le nom du premier transporteur peut être inscrit en abrégé sur le recto de la présente. Sa dénomination complète et abrégée doit figurer sur ses tarifs, sur ses conditions générales de transport, sur ses règlements et sur ses horaires. L'adresse du premier transporteur aérien est celle de l'aéroport du point de départ du transport, qui figure au recto de la présente. Les arrêts prévus (susceptibles d'être modifiés par le transporteur en cas de nécessité) sont les points, à l'exception des points de départ et de destination, qui sont indiqués au recto de la présente ou qui figurent aux horaires du transporteur comme des arrêts réguliers de l'itinéraire. Le transport qui doit être effectué, en vertu du présent contrat par plusieurs transporteurs successifs, est réputé ne constituer qu'une seule et même opération.
- Sauf dispositions contraires figurant dans les conditions générales de transport ou dans le tarif du transporteur, la responsabilité du transporteur est limitée, pour les transports non régis par la Convention de Varsovie, à 20 US ou à un montant équivalent par kilogramme de marchandise perdue, endommagée ou dont l'acheminement a été retardé, à moins qu'une valeur plus élevée n'ait été déclarée par l'expéditeur et qu'un supplément n'ait été payé.
- Il y a déclaration spéciale d'intérêt si le montant inscrit au recto de la lettre de transport aérien comme "valeur déclarée au départ" est supérieure aux limites applicables de responsabilité mentionnées dans l'avis ci-dessus et dans les présentes conditions de transport, et si l'expéditeur a payé le supplément prévu dans les tarifs, dans les conditions générales de transport ou dans les règlements du transporteur. Dans ce cas, la responsabilité du transporteur est limitée à la valeur déclarée. Pour qu'une réclamation donne lieu à remboursement, la preuve doit être apportée des dommages réellement subis.
- En cas de perte, d'avarie ou de retard d'une partie de l'expédition seul le poids du ou des colis en cause est pris en considération pour déterminer la limite de responsabilité du transporteur.

NOTA : Nonobstant toute autre disposition, lorsque le transport répond à la définition de "foreign air transportation" du Federal Aviation Act des États-Unis, tel que modifié, le poids utilisé pour le calcul de la limite de responsabilité du transporteur en cas de perte, d'avarie ou de retard de tout ou partie d'une expédition est le poids (ou la partie du poids calculée au prorata de la partie de l'expédition touchée par la perte, l'avarie ou le retard) utilisé pour l'établissement des frais de transport de ladite expédition.
- Toute exclusion ou limitation de responsabilité applicable au transporteur s'applique également à ses agents, préposés et représentants de même qu'à toute personne dont l'aéronef viendrait à être utilisé par le transporteur, pour ce qui concerne les agents, préposés et représentants d'une telle personne. En ce qui concerne cette disposition, le transporteur est réputé agent de ces personnes.
- Le transporteur s'engage à effectuer aussi promptement que possible le transport objet de la présente. Le transporteur peut faire appel à d'autres transporteurs, utiliser d'autres aéronefs et, sans préavis et en tenant compte de l'intérêt de l'expéditeur, acheminer les marchandises par d'autres moyens de transport. Le transporteur est libre de choisir l'itinéraire par lequel la marchandise sera acheminée, il peut également modifier l'itinéraire figurant au recto de la présente. Le présent alinéa ne s'applique pas aux expéditions en provenance ou à destination des États-Unis.
 - Le transporteur s'engage à effectuer aussi promptement que possible le transport objet de la présente. À l'exception du territoire des États-Unis, où les tarifs du transporteur s'appliquent, ce dernier peut faire appel à d'autres transporteurs, utiliser d'autres aéronefs et, sans préavis et en tenant compte de l'intérêt de l'expéditeur, acheminer les marchandises par d'autres moyens de transport. Le transporteur est libre de choisir l'itinéraire par lequel la marchandise sera acheminée, il peut également modifier l'itinéraire figurant au recto de la présente. Le présent alinéa s'applique exclusivement aux expéditions en provenance ou à destination des États-Unis.
- Sous réserve des dispositions de la présente, le transporteur est responsable des marchandises durant la période où elles sont en sa possession ou celle de ses agents.
- Sauf lorsque le transporteur a fait crédit au destinataire sans le consentement écrit de l'expéditeur, ce dernier garantit le paiement de tous frais de transport exigibles en vertu du tarif du transporteur ou de sa réglementation, sous réserve de l'application des lois applicables, en vertu des lois applicables (y compris les lois nationales ratifiant la Convention), décisions, instructions et règlements gouvernementaux.
 - Si aucune partie de l'expédition n'est livrée, la réclamation est recevable même si les frais de transport afférents n'ont pas été acquittés.
- Le destinataire ou la personne à prévenir mentionnée au recto de la présente, est avisée promptement de l'arrivée de la marchandise. La marchandise arrivée à destination est livrée au destinataire ou conformément à ses instructions, sous réserve de l'acceptation d'autres instructions de l'expéditeur avant l'arrivée des marchandises à destination. Si le destinataire n'accepte pas la marchandise ou s'il ne peut être rejoint, la livraison est faite selon les instructions de l'expéditeur.
- La personne autorisée à enlever la marchandise doit adresser au transporteur une réclamation écrite dans les cas suivants :
 - marchandise visiblement endommagée : la réclamation doit être faite dès la découverte du dommage et au plus tard dans un délai de 14 jours à compter de la date de réception de la marchandise;
 - autres dommages : la réclamation doit être faite dans un délai de 14 jours à compter de la date de réception;
 - retard : le délai est de 21 jours à compter du jour où la marchandise a été mise à sa disposition;
 - non-livraison : le délai est porté à 120 jours à compter de la date d'établissement de la lettre de transport aérien.
 - En ce qui concerne l'alinéa a) ci-dessus, la réclamation écrite peut être adressée au transporteur dont la lettre de transport aérien a été utilisée, au premier ou au dernier transporteur, ou encore au transporteur qui a effectué le transport au cours duquel la perte, le dommage ou le retard s'est produit.
 - Toute action en responsabilité à l'encontre du transporteur doit être intentée, sous peine de déchéance, dans un délai de deux ans à compter de la date de l'arrivée à destination, de la date à laquelle l'aéronef aurait dû arriver ou de la date à laquelle le transport a été interrompu.
- L'expéditeur est tenu de se conformer aux lois et règlements gouvernementaux en vigueur dans les pays de destination, d'origine et de transit des marchandises ainsi que dans les pays survolés, y compris les dispositions relatives à l'emballage, au transport et à la livraison des marchandises. Il doit fournir tous renseignements utiles et joindre à la lettre de transport aérien tous documents exigés par ces lois et règlements. Le transporteur n'assume aucune responsabilité à l'égard de l'expéditeur ou de toute autre personne pour les dommages subis ou les dépenses engagées du fait de l'inobservation par l'expéditeur de la présente disposition.
- Aucun agent, préposé ou représentant du transporteur n'est autorisé à changer, modifier ou supprimer l'une quelconque des dispositions du présent contrat.
- Sur demande et moyennant paiement de la prime correspondante, qui devra figurer au recto de la présente, les marchandises sont assurées au moyen d'une police flottante pour le montant désigné au recto (la couverture est limitée à la valeur réelle des marchandises perdues ou endommagées jusqu'à concurrence de la valeur assurée). Cette couverture, qui exclut certains risques, est assujettie aux conditions de la police flottante, qui peut être consultée par la partie intéressée à un bureau du transporteur émetteur. Les demandes de règlement au titre de cette assurance doivent être adressées immédiatement à un bureau du transporteur.

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE: 16 JUNE 02

TIME: 11:00

TO: JACK STALL

PHONE:

FAX:

780 495-7963

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 2

RE: ASI 43 Form

JACK

STATEMENT OF COMPLIANCE FROM TED

STF.

AERO DESIGN LTD.

1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE: 16 JUNE '02

TIME: 11:00

TO: MARK

PHONE:

WISK-AIR

FAX:

(807) 473-5185

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 2

RE: Form ASI

MARK: THIS IS THE FORM THAT THE
T.C. WANTS

STF.

Staal, Jack

To: Massicotte, Serge
Subject: RE: Aero Design cargo basket 206L series - Flight Test

Thanks, Dan Maunula will witness the flight test briefing.

Monday is going to be crammed. The conformity, company flight test, and possibly TC flight test. Definitely count on staying Tuesday I would say.

cc: Aero Design by Facs.
Wisk-air by Facs.

Regards

J. H. (Jack) Staal
Transport Canada
Aircraft Certification
1100 - 9700 Jasper Avenue
Edmonton, Alberta
T6J 4E6

voice 780-495-5227
fax 780-495-7963
e-mail: staalj@tc.gc.ca

-----Original Message-----

From: Massicotte, Serge
Sent: 2002 June 14 6:31 AM
To: Maunula, Daniel; Staal, Jack
Subject: RE:

Steve @ Aero Design Ltd
Can you ensure that
Wisk-air has ballast
and WEB/load
configurations to
achieve the two
basket on flight test
CofG configurations*.
Thanks JS.

Good morning,

* I was out of the office for a couple of days but looks like everything is fine for Monday. My flight is booked and I'm landing in Thunder Bay at 12:30 (WestJet Flt 584). I'll get a car and then make my way to Wisk Air, I'll be ready to fly in the afternoon. As far as flying is concerned, I'll be looking for probably two flights with the basket installed (heavy fwd / right CG - load in basket; and light aft / lat neutral CG - basket empty). One additional flight without the basket to compare a few numbers (weight/CG TBD). We'll also require dual controls to be installed with measuring tapes set up on the copilot side to record control positions. I'll bring some tapes with me. I will stay in Thunder Bay for a few days if required however I don't think Wisk Air wants to drag this on too long.

Give me a call if there's anything else. I'll give you my home number in case something happens during the weekend and the trip needs to be postponed (819-775-4625).

Regards,

Serge Massicotte
Engineering Test Pilot
Aircraft Certification
(613) 941-6212

-----Original Message-----

From: Maunula, Daniel
Sent: June 11, 2002 5:49 PM
To: Staal, Jack; Massicotte, Serge
Cc: Hochins, Peter
Subject: RE:

I don't anticipate a problem with doing the conformity Monday morning if Wisk Air is ready with the aircraft. I have looked at the drawings, (a quick review so far.)

-----Original Message-----

From: Staal, Jack

Sent: Tuesday, June 11, 2002 1:59 PM

To: Massicotte, Serge

Cc: Maunula, Daniel; Hochins, Peter

Subject:

Serge the conformity is scheduled for Monday morning. If the conformity goes well (I expect it will) the afternoon should be available for flying.

Dan Maunula from the Thunder Bay office will witness the test flight briefing on Monday.

Regards,

J. H. (Jack) Staal

Transport Canada

Aircraft Certification

1100 - 9700 Jasper Avenue

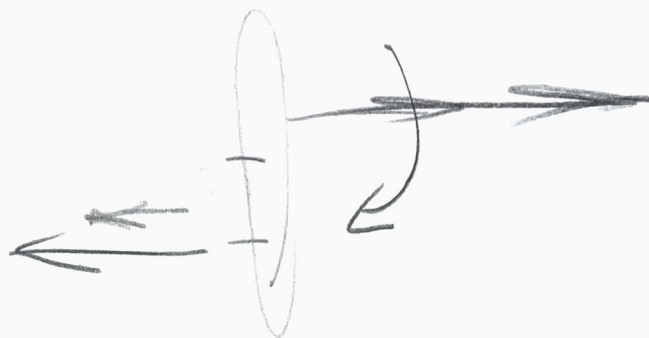
Edmonton, Alberta

T5J 4E6

voice 780-495-5227

fax 780-495-7963

e-mail: staalj@tc.gc.ca



AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 14, 2002

TIME: 10:52 AM

TO: Kevin / Alex

PHONE: 807-475-4510

Wisk-Air

FAX: 807-473-5485

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 4/5

RE: WEIGHT AND BALANCE DATA

Oops,

I looked over what I did yesterday and noticed that what you actually need is a Heavy/Forward/Right CG. Sorry for the mix-up. I've revised my W/B table and am enclosing it in the fax, along with the e-mails from Transport on the issue. Dan Maunula is the inspection that will be looking over the basket, and Serge Massicotte is the Flight Test Pilot that will fly the machine on Monday, weather permitting.

I hope you have dual controls installed!

Steve

BELL 206L : C-FBHM

ITEM	WEIGHT	LONGITUDINAL		LATERAL	
		ARM	MOMENT	ARM	MOMENT
Empty Prior to Basket Installation	2429.2	128.99	313343	-0.14	-330
PILOT	200.0	65.00	13000	14.00	2800
CO-PILOT	0.0	65.00	0	-11.00	0
AFT FACING PAX LEFT	225.0	91.00	20475	-12.90	-2903
AFT FACING PAX RIGHT	200.0	91.00	18200	12.90	2580
FWD FACING PAX LEFT	0.0	129.00	0	-15.80	0
FWD FACING PAX CENTER	0.0	129.00	0		
FWD FACING PAX RIGHT	0.0	129.00	0	15.80	0
AFT BAGGAGE COMPARTMENT	0.0	174.00	0		
FLITE-STEP REMOVAL	-9.0	113.50	-1022	34.88	-314
CARGO BASKET INSTALLATION	66.0	113.30	7478	30.50	2013
CARGO BASKET PAYLOAD	200.0	104.00	20800	38.50	7700
UNUSABLE FUEL (INCLUDED)	0.0	94.00	0		
FULL OIL	13.0	205.00	2665		
Empty Fuel TOTAL	3324.2	118.81	394939	3.47	11546
MOST AFT FUEL CG	320.4	138.80	44472		
MOST AFT FUEL CG TOTAL	3644.6	120.56	439411	3.17	11546
MOST FWD FUEL CG	475.0	121.80	57855		
MOST FWD FUEL CG TOTAL	3799.2	119.18	452794	3.04	11546
MINUS 10 MIN. RAMP FUEL	646.0	128.30	82882		
FULL FUEL TOTAL TAKEOFF	3970.2	120.35	477821	2.91	11546
FULL FUEL	665.7	128.90	85809		
FULL FUEL TOTAL RAMP WEIGHT	3989.9	120.49	480748	2.89	11546

EXAMPLE ONLY!

CARGO IN FRONT OF BASKET

114.1 Center of Basket

1.0 GALLON UNUSABLE
5.5 QUARTS TOTAL

47.1 GALLONS (AFT CG)

69.8 GALLONS (FWD CG)

95.0 3% USED IN RUN-UP

97.9 GALLONS TOTAL

CHECK WEIGHT LIMITS	CHECK LONG. LIMITS	CHECK LATERAL LIMITS
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK

<u>LIMITATIONS:</u>	W	FWD CG	AFT CG	LEFT CG	RIGHT CG
	2800.0	118.00	128.50	-4.00	3.50
	2900.0	118.09	128.50	-4.00	3.50
	4000.0	119.10	126.80	-4.00	3.50

BELL 206L : C-FBHM

ITEM	WEIGHT	LONGITUDINAL		LATERAL	
		ARM	MOMENT	ARM	MOMENT
Empty Prior to Basket Installation	2429.2	128.99	313343	-0.14	-330
PILOT	200.0	65.00	13000	14.00	2800
CO-PILOT	175.0	65.00	11375	-11.00	-1925
AFT FACING PAX LEFT	0.0	91.00	0	-12.90	0
AFT FACING PAX RIGHT	125.0	91.00	11375	12.90	1613
FWD FACING PAX LEFT	0.0	129.00	0	-15.80	0
FWD FACING PAX CENTER	125.0	129.00	16125		
FWD FACING PAX RIGHT	0.0	129.00	0	15.80	0
AFT BAGGAGE COMPARTMENT	0.0	174.00	0		
FLITE-STEP REMOVAL	-9.0	113.50	-1022	34.88	-314
CARGO BASKET INSTALLATION	66.0	113.30	7478	30.50	2013
CARGO BASKET PAYLOAD	200.0	104.00	20800	38.50	7700
UNUSABLE FUEL (INCLUDED)	0.0	94.00	0		
FULL OIL	13.0	205.00	2665		
Empty Fuel TOTAL	3324.2	118.87	395139	3.48	11556
MOST AFT FUEL CG	320.4	138.80	44472		
MOST AFT FUEL CG TOTAL	3644.6	120.62	439611	3.17	11556
MOST FWD FUEL CG	475.0	121.80	57855		
MOST FWD FUEL CG TOTAL	3799.2	119.23	452994	3.04	11556
MINUS 10 MIN. RAMP FUEL	646.0	128.30	82882		
FULL FUEL TOTAL TAKEOFF	3970.2	120.40	478021	2.91	11556
FULL FUEL	665.7	128.90	85809		
FULL FUEL TOTAL RAMP WEIGHT	3989.9	120.54	480948	2.90	11556

EXAMPLE ONLY!

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5.5 QUARTS TOTAL

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CHECK WEIGHT LIMITS	CHECK LONG. LIMITS	CHECK LATERAL LIMITS
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK

LIMITATIONS:

W	FWD CG	AFT CG	LEFT CG	RIGHT CG
<u>2800.0</u>	<u>118.00</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
<u>2900.0</u>	<u>118.09</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
<u>4000.0</u>	<u>119.10</u>	<u>126.80</u>	<u>-4.00</u>	<u>3.50</u>

BELL 206L : C-FBHM

ITEM	WEIGHT	LONGITUDINAL		LATERAL	
		ARM	MOMENT	ARM	MOMENT
Empty Prior to Basket Installation	2429.2	128.99	313343	-0.14	-330
PILOT	200.0	65.00	13000	14.00	2800
CO-PILOT	175.0	65.00	11375	-11.00	-1925
AFT FACING PAX LEFT	0.0	91.00	0	-12.90	0
AFT FACING PAX RIGHT	0.0	91.00	0	12.90	0
FWD FACING PAX LEFT	0.0	129.00	0	-15.80	0
FWD FACING PAX CENTER	0.0	129.00	0		
FWD FACING PAX RIGHT	0.0	129.00	0	15.80	0
AFT BAGGAGE COMPARTMENT	250.0	174.00	43500		
FLITE-STEP REMOVAL	-9.0	113.50	-1022	34.88	-314
CARGO BASKET INSTALLATION	66.0	113.30	7478	30.50	2013
CARGO BASKET PAYLOAD	0.0	104.00	0	38.50	0
UNUSABLE FUEL (INCLUDED)	0.0	94.00	0		
FULL OIL	13.0	205.00	2665		
Empty Fuel TOTAL	3124.2	124.94	390339	0.72	2244
MOST AFT FUEL CG	320.4	138.80	44472		
MOST AFT FUEL CG TOTAL	3444.6	126.23	434811	0.65	2244
MOST FWD FUEL CG	475.0	121.80	57855		
MOST FWD FUEL CG TOTAL	3599.2	124.53	448194	0.62	2244
MINUS 10 MIN. RAMP FUEL	646.0	128.30	82882		
FULL FUEL TOTAL TAKEOFF	3770.2	125.52	473221	0.60	2244
FULL FUEL	665.7	128.90	85809		
FULL FUEL TOTAL RAMP WEIGHT	3789.9	125.64	476148	0.59	2244

EXAMPLE ONLY!

EMPTY
114.1 Center of Basket

1.0 GALLON UNUSABLE
5.5 QUARTS TOTAL

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OK	OK	OK
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OK	OK	OK
OK	OK	OK
OK	OK	OK

<u>LIMITATIONS:</u>	W	FWD CG	AFT CG	LEFT CG	RIGHT CG
	<u>2800.0</u>	<u>118.00</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>2900.0</u>	<u>118.09</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>4000.0</u>	<u>119.10</u>	<u>126.80</u>	<u>-4.00</u>	<u>3.50</u>

BELL 206L : C-FBHM

ITEM	WEIGHT	LONGITUDINAL		LATERAL	
		ARM	MOMENT	ARM	MOMENT
Empty Prior to Basket Installation	2429.2	128.99	313343	-0.14	-330
PILOT	200.0	65.00	13000	14.00	2800
CO-PILOT	0.0	65.00	0	-11.00	0
AFT FACING PAX LEFT	0.0	91.00	0	-12.90	0
AFT FACING PAX RIGHT	0.0	91.00	0	12.90	0
FWD FACING PAX LEFT	0.0	129.00	0	-15.80	0
FWD FACING PAX CENTER	0.0	129.00	0		
FWD FACING PAX RIGHT	0.0	129.00	0	15.80	0
AFT BAGGAGE COMPARTMENT	50.0	174.00	8700		
FLITE-STEP REMOVAL	-9.0	113.50	-1022	34.88	-314
CARGO BASKET INSTALLATION	66.0	113.30	7478	30.50	2013
CARGO BASKET PAYLOAD	0.0	104.00	0	38.50	0
UNUSABLE FUEL (INCLUDED)	0.0	94.00	0		
FULL OIL	13.0	205.00	2665		
Empty Fuel TOTAL	2749.2	125.19	344164	1.52	4169
MOST AFT FUEL CG	320.4	138.80	44472		
MOST AFT FUEL CG TOTAL	3069.6	126.61	388636	1.36	4169
MOST FWD FUEL CG	475.0	121.80	57855		
MOST FWD FUEL CG TOTAL	3224.2	124.69	402019	1.29	4169
MINUS 10 MIN. RAMP FUEL	646.0	128.30	82882		
FULL FUEL TOTAL TAKEOFF	3395.2	125.78	427046	1.23	4169
FULL FUEL	665.7	128.90	85809		
FULL FUEL TOTAL RAMP WEIGHT	3414.9	125.91	429973	1.22	4169

EXAMPLE ONLY!

EMPTY
114.1 Center of Basket

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5.5 QUARTS TOTAL

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<u>LIMITATIONS:</u>	W	FWD CG	AFT CG	LEFT CG	RIGHT CG
	<u>2800.0</u>	<u>118.00</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>2900.0</u>	<u>118.09</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>4000.0</u>	<u>119.10</u>	<u>126.80</u>	<u>-4.00</u>	<u>3.50</u>

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 13, 2002

TIME: 3:31 PM

TO: Kevin / Alex

PHONE: 807-475-4510

Wisk-Air

FAX: 807-473-5485

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 4

RE: WEIGHT AND BALANCE DATA

I just ran out and measured a 206L3 next door with a "Flitestep". The lateral arm of one step is 34.875". I agree with the longitudinal arm you have of 113.5".

Some things to pass on about the flight test: when balancing the helicopter, aim for heavy, aft CG, and right CG, and all without going out of limits. This will make the results of the flight test representative of the *worst* conditions the helicopter can be in.

Load the basket with weight concentrated in the back, and adjust the station of the cargo in the basket accordingly. Then fill the baggage compartment with about 200 Lb to move the CG farther aft, and then add weight to the left-side passenger seats to correct the CG. If the co-pilot's seat is occupied, then you may not need to add any weight in the passenger seats. I've worked this out approximately on the sheets attached, but your own W/B will be the final word.

Any weight that you do put in the cabin should be fastened down as well as possible – don't want it shifting from left to right during a turn... For flight tests we've done in the past, we've put bags of lead shot (25 Lb each) into the aircraft. Do you have anything equivalent?

The other page I've attached involves the shims that fit under the nuts inside the landing gear fittings. Tooling for the internal spotface isn't available in the time frame we have committed to, hence the change.

Steve

BELL 206L

ITEM	WEIGHT	LONGITUDINAL		LATERAL	
		ARM	MOMENT	ARM	MOMENT
Empty	2486.2	128.63	319800	0.55	1370
PILOT	200.0	65.00	13000	14.00	2800
CO-PILOT	175.0	65.00	11375	-11.00	-1925
AFT FACING PAX LEFT	0.0	91.00	0	-12.90	0
AFT FACING PAX RIGHT	0.0	91.00	0	12.90	0
FWD FACING PAX LEFT	0.0	129.00	0	-15.80	0
FWD FACING PAX CENTER	0.0	129.00	0	0.00	0
FWD FACING PAX RIGHT	0.0	129.00	0	15.80	0
AFT BAGGAGE COMPARTMENT	200.0	174.00	34800		
FLITE-STEP REMOVAL	-9.0	113.50	-1022	34.88	-314
CARGO BASKET INSTALLATION	66.0	113.30	7478	30.50	2013
CARGO BASKET PAYLOAD	200.0	122.90	24580	38.50	7700
UNUSABLE FUEL (INCLUDED)	0.0	94.00	0	0.00	0
FULL OIL	13.0	205.00	2665	0.00	0
Empty Fuel TOTAL	3331.2	123.88	412676	3.50	11644
MOST AFT FUEL CG	320.4	138.80	44472		
MOST AFT FUEL CG TOTAL	3651.6	125.19	457148	3.19	11644
MOST FWD FUEL CG	475.0	121.80	57855		
MOST FWD FUEL CG TOTAL	3806.2	123.62	470531	3.06	11644
MINUS 10 MIN. RAMP FUEL	646.0	128.30	82882		
FULL FUEL TOTAL TAKEOFF	3977.2	124.60	495558	2.93	11644
FULL FUEL	665.7	128.90	85809		
FULL FUEL TOTAL RAMP WEIGHT	3996.9	124.72	498485	2.91	11644

CO-PILOT

CARGO AT
BACK OF
BASKET

EXAMPLE ONLY

114.1 Center of Basket

1.0 GALLON UNUSABLE
5.5 QUARTS TOTAL

47.1 GALLONS (AFT CG)

69.8 GALLONS (FWD CG)

95.0 3% USED IN RUN-UP

97.9 GALLONS TOTAL

CHECK WEIGHT LIMITS	CHECK LONG. LIMITS	CHECK LATERAL LIMITS
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK

LIMITATIONS:	W	FWD CG	AFT CG	LEFT CG	RIGHT CG
	<u>2800.0</u>	<u>118.00</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>2900.0</u>	<u>118.09</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>4000.0</u>	<u>119.10</u>	<u>126.80</u>	<u>-4.00</u>	<u>3.50</u>

BELL 206L

ITEM	WEIGHT	LONGITUDINAL		LATERAL	
		ARM	MOMENT	ARM	MOMENT
Empty	2486.2	128.63	319800	0.55	1370
PILOT	200.0	65.00	13000	14.00	2800
CO-PILOT	0.0	65.00	0	-11.00	0
AFT FACING PAX LEFT	175.0	91.00	15925	-12.90	-2258
AFT FACING PAX RIGHT	0.0	91.00	0	12.90	0
FWD FACING PAX LEFT	0.0	129.00	0	-15.80	0
FWD FACING PAX CENTER	0.0	129.00	0	0.00	0
FWD FACING PAX RIGHT	0.0	129.00	0	15.80	0
AFT BAGGAGE COMPARTMENT	200.0	174.00	34800		
FLITE-STEP REMOVAL	-9.0	113.50	-1022	34.88	-314
CARGO BASKET INSTALLATION	66.0	113.30	7478	30.50	2013
CARGO BASKET PAYLOAD	200.0	122.90	24580	38.50	7700
UNUSABLE FUEL (INCLUDED)	0.0	94.00	0	0.00	0
FULL OIL	13.0	205.00	2665	0.00	0
Empty Fuel TOTAL	3331.2	125.25	417226	3.40	11312
MOST AFT FUEL CG	320.4	138.80	44472		
MOST AFT FUEL CG TOTAL	3651.6	126.44	461698	3.10	11312
MOST FWD FUEL CG	475.0	121.80	57855		
MOST FWD FUEL CG TOTAL	3806.2	124.82	475081	2.97	11312
MINUS 10 MIN. RAMP FUEL	646.0	128.30	82882		
FULL FUEL TOTAL TAKEOFF	3977.2	125.74	500108	2.84	11312
FULL FUEL	665.7	128.90	85809		
FULL FUEL TOTAL RAMP WEIGHT	3996.9	125.86	503035	2.83	11312

BALLAST WEIGHT IN AFT-LEFT
PAX SEAT

CARGO AT
BACK OF
BASKET

EXAMPLE ONLY

114.1 Center of Basket

1.0 GALLON UNUSABLE
5.5 QUARTS TOTAL

47.1 GALLONS (AFT CG)

69.8 GALLONS (FWD CG)

95.0 3% USED IN RUN-UP

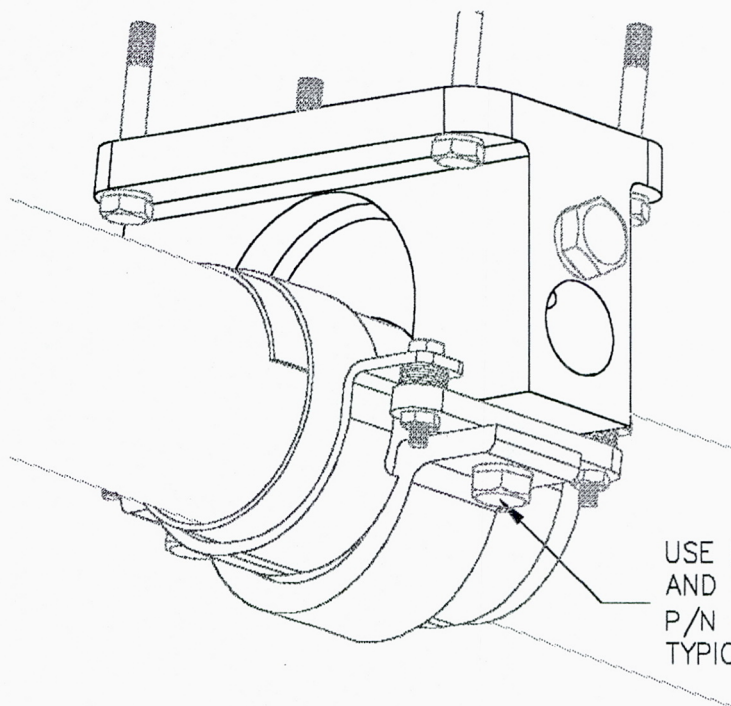
97.9 GALLONS TOTAL

CHECK WEIGHT LIMITS	CHECK LONG. LIMITS	CHECK LATERAL LIMITS
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK

<u>LIMITATIONS:</u>	W	FWD CG	AFT CG	LEFT CG	RIGHT CG
	<u>2800.0</u>	<u>118.00</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>2900.0</u>	<u>118.09</u>	<u>128.50</u>	<u>-4.00</u>	<u>3.50</u>
	<u>4000.0</u>	<u>119.10</u>	<u>126.80</u>	<u>-4.00</u>	<u>3.50</u>

CHANGES

- WHERE BOTTOM OF FITTING 49312-01 IS SPOTFACED INTERNALLY, USE ORIGINAL HARDWARE TO MOUNT LANDING GEAR CROSS-TUBE.
WHERE THE FITTING IS NOT SPOTFACED INTERNALLY, USE SEMI-CIRCULAR WASHER (49319-01) UNDER NUT.



03 AFT FITTING

AN6 BOLT ORIENTED FORWARD
TYPICAL LEFT AND RIGHT

APPROVALS		DATE		AERO DESIGN LTD. ENGINEERING CONSULTANTS 1045 McTAVISH ROAD N.E. CALGARY, ALBERTA T2E 7G9							
DRAWN: STEVEN FAHEY		JUN 06/02									
CHECKED: E. BURGON		JUN 06/02									
STRESS:											
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				DRAWING CHANGE NOTICE							
				The changes indicated are applicable to the initial issue and/or to previous Drawing Change Notices for this drawing and supercede the information from the initial issue of the drawing and/or any earlier Drawing Change Notices. This Drawing Change Notice must accompany the drawing it applies to at all times.							
		SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.		CHG.	
		SHEET 1 OF 1		A4		49301		0		A	

From :

PHONE No. : 00

Jun. 14 2002 10:56AM P01

P. 01

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 14, 2002

TIME: 10:52 AM

TO: Kevin / Alex

PHONE: 807-475-4510

Wiak-Air

FAX: 807-473-5485

FROM: S. Fahey
Aero Design Ltd.PHONE: 403-250-8027
FAX: 403-250-8333

Number of pages including cover sheet: 40

Number of pages including cover sheet: 40

RE: WEIGHT AND BALANCE DATA

Oops,

I looked over what I did yesterday and noticed that what you actually need is a Heavy/Forward/Right CG. Sorry for the mix-up. I've revised my W/B table and am enclosing it in the fax, along with the e-mails from Transport on the issue. Dan Maunula is the inspection that will be looking over the basket, and Serge Massicotte is the Flight Test Pilot that will fly the machine on Monday, weather permitting.

I hope you have dual controls installed!

Steve

Steve - Attached is W&B
Ammend 4b (Basket plus duals)

— Alex.

WISK - AIR HELICOPTERS TEMPORARY CONFIGURATION

AIRCRAFT REGISTRATION:

C-FBHM

S/N:

45066

DATE:

13-Jun-02

A/C Type Bell 206L-R		WEIGHT & BALANCE DATED:				19-Apr-99		Temp Config No.		4b	
WEIGHT & BALANCE		CONFIGURATION				EMPTY WEIGHT	HORIZONTAL		LATERAL		
							ARM	MOMENT	ARM	MOMENT	
INSTALLATION		INSTALLED	REMOVED	WEIGHT							
Empty Weight Configuration as at		N/A	N/A	2429.2		2429.2	128.99117	313345.36	-0.013576	-329.79	
25-May-00											
INSTALL Cargo Basket		INSTALL		66.00			113.30	7477.80	30.50	2013.00	
P/N 49201-01											
FMS492.01											
SH00-48, Issue 3											
Remove Flight Step		REMOVE		-9.00			113.50	-1021.50	34.875	-313.88	
From AAI Kit 206-326-202											
Dual Controls - Quick Connect											
Kit #206-706-127-1		INSTALL		9.80			49.00	480.20	-13.90	-136.22	
Remove RT7200 FM VHF			REMOVE	-9.00			19.00	-171.00	-9.00	81.00	
TOTAL CHANGE				57.80							
AMENDED WEIGHT & BALANCE AND CENTRE OF GRAVITY						2487.00	128.71366	320110.86	0.5283936	1314.115	

FOR LATERAL ARM: - IS LEFT AND + IS RIGHT

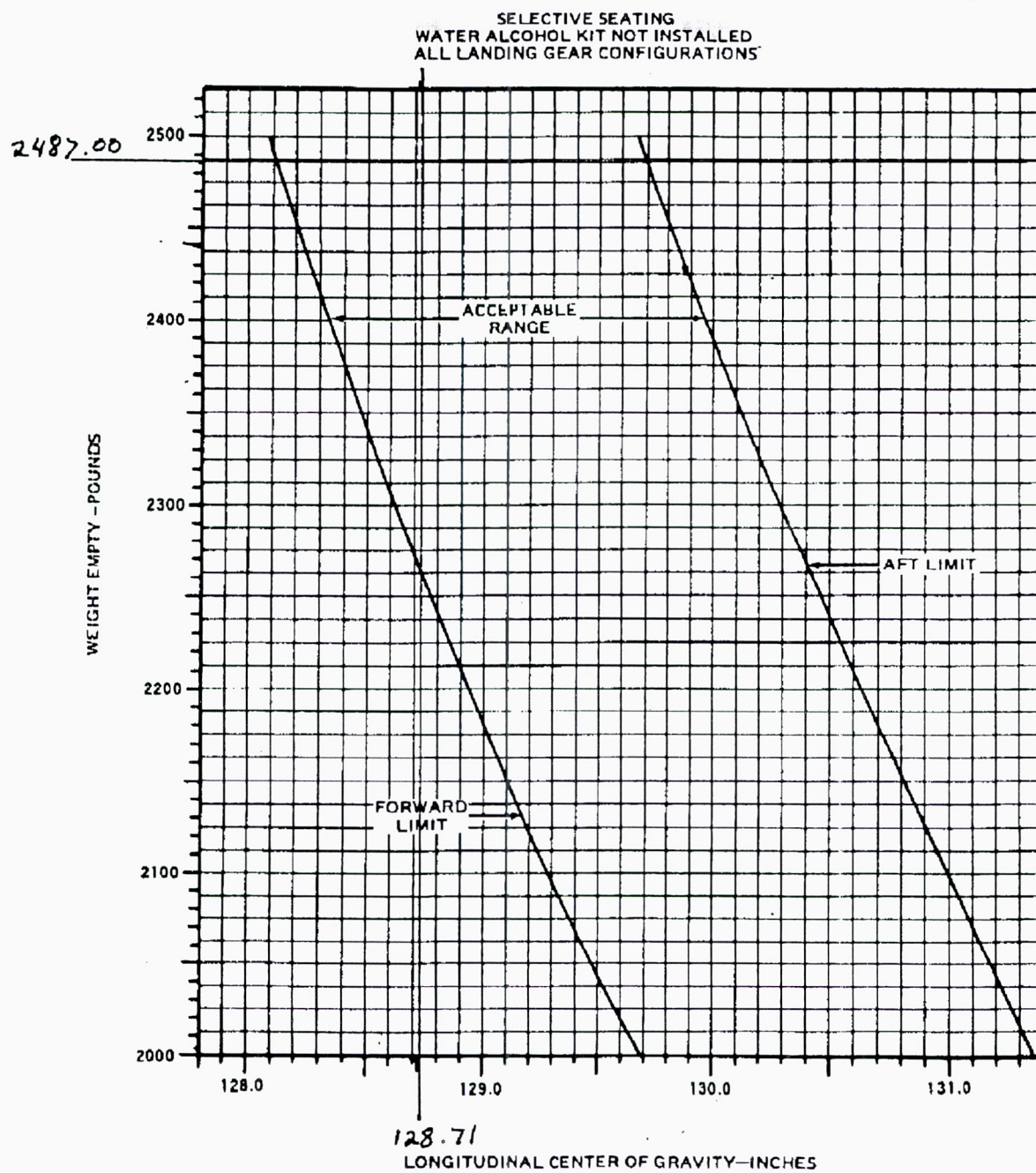
The work described above has been performed in accordance with the applicable standards of airworthiness.

Signature

License No.

MAINTENANCE MANUAL

Model 206L



L206900-74

Figure B-3. Center of gravity vs weight empty chart (water alcohol kit not installed)

Rev. 10

8-10-00
8-9

**wiskair**

H E L I C O P T E R S

304 Hector Dougall Way
Thunder Bay, Ontario
P7E 6M6Telephone 807-475-4510
Toll Free 1-800-579-4510
Fax 807-473-5485
Email info@wiskair.com**Fax**

To: Steve From: Alex
Fax: 403-250-8333 Pages: 2
Phone: _____ Date: _____
Re: _____ CC: _____

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

Empty WAB for ~~the~~ C-FBHM
& Basket.

Sh

WISK - AIR HELICOPTERS TEMPORARY CONFIGURATION

AIRCRAFT REGISTRATION:

C-FBHM

S/N:

45066

DATE:

13-Jun-02

A/C Type Bell 206L-R		WEIGHT & BALANCE DATED:				19-Apr-99		Temp Config No.		4	
WEIGHT & BALANCE		CONFIGURATION				EMPTY WEIGHT	HORIZONTAL		LATERAL		
INSTALLATION		INSTALLED	REMOVED	WEIGHT			ARM	MOMENT	ARM	MOMENT	
Empty Weight Configuration as at 25-May-00		N/A	N/A	2429.2		2429.2	128.99117	313345.36	-0.013576	-329.79	
INSTALL Cargo Basket		INSTALL		66.00			113.30	7477.80	30.50	2013.00	
P/N 49201-01											
FMS492.01											
SH00-48, Issue 3											
Remove Flight Step		REMOVE		-9.00			113.50	-1021.50	34.88	-313.88	
From AAI Kit 206-326-202											
TOTAL CHANGE				57.00							
AMENDED WEIGHT & BALANCE AND CENTRE OF GRAVITY						2486.2	128.63071	319801.66	0.5507743	1369.335	

FOR LATERAL ARM: - IS LEFT AND + IS RIGHT

The work described above has been performed in accordance with the applicable standards of airworthiness.

Signature

License No.

PACKING SLIP

Ship to:

27 May, 2002

JUNE 13, 2002

Heli Inter
10 Route 117
Malartic, Québec
J0Y 1Z0

(450) 468-3431

Attention:

c/o: Daniel Hauver (Coast to Coast Heli)

Reference: Your Purchase Order: DH 46612

Quantity Ordered	Quantity Shipped	Description	Part Number
2	2	200 Lb Cargo Basket Assembly	49205-01
2	2	Forward Support Beam	49221-01
2	2	Aft Support Beam	49221-02
4	4	Forward External Attachment Fitting	49311-01
4	4	Aft External Attachment Fitting	49312-01
8	8	Barrel Nut	49320-01
4	4	Washer	49319-01
10	10	Bolt	AN4-24A
20	20	Washer	AN960JD416
10	10	Nut	MS21044N4
10	10	Bolt	AN6-20A
10	10	Washer	AN960JD606
2	2	Installation Drawing – Cargo Basket	49201
2	2	Installation Drawing – Fittings	49301
2	2	Drawing Change Notice– Fittings Installation	DCN49301A

SENT MAY 27, 2002
SENT JUNE 13, 2002

1

Staal, Jack

From: Staal, Jack
Sent: 2002 June 10 2:16 PM
To: Maunula, Daniel
Cc: Hochins, Peter
Subject: Aero Design Ltd/ Cargo Basket/ Bell 206L series/ Whisk Air

Hi Dan:

Concerning the flight permit for certification testing of the Aero Design basket on Whisk Air's 206L

The engineering conditions are:

- Aero Design draft Flight Manual Supplement FMS 492.01 dated 17 May 2002 is required.**
- Basket installation to Aero Design Ltd DCL 492, Rev 0, dated 17 May 2002.**
- flight to 1.1 Vne is authorized pursuant to the flight test program**

The following are raised as a memory jog I presume you have standard wording for these. Add as you see fit.

- essential crew only
- no flight over built up areas (except for takeoff and landing)
- within _____ km from Thunder Bay
- aircraft to be signed safe and serviceable by qualified personnel.
- up to date weight and balance to be available
- flight over foreign territory???
- Day VFR
- others ????

cc Aero Design Ltd via Facs.

J.H. (Jack) Staal
Transport Canada
Aircraft Certification
1100 - 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

voice 780-495-5227
fax 780-495-7963
e-mail: staalj@tc.gc.ca

2002 June 10

Staal, Jack

From: Staal, Jack
Sent: 2002 June 10 2:16 PM
To: Maunula, Daniel
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Subject: Aero Design Ltd/ Cargo Basket/ Bell 206L series/ Whisk Air

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- Day VFR
- others ????

cc Aero Design Ltd via Facs.

J.H. (Jack) Staal
 Transport Canada
 Aircraft Certification
 1100 - 9700 Jasper Avenue
 Edmonton, Alberta
 T5J 4E6

voice 780-495-5227
 fax 780-495-7963
 e-mail: staalj@tc.gc.ca

Staal, Jack

From: Staal, Jack
Sent: 2002 June 04 4:43 PM
To: Hochins, Peter
Cc: Massicotte, Serge
Subject: Conformity Inspection, Flight Permit

613-941-6212

Hi Peter

I don't believe we have communicated before.

I have a project involving a cargo basket for the Bell 206L series. The project needs to be flight tested. I have tentatively reserved the week of June 17th for flight testing by an Ottawa test pilot (exact day yet to be determined). This is subject to the conformity inspection being completed, a flight permit being in place, witness being available per ACSI 43. I still have some work to do on the engineering review as well, but I expect all this will come together.

Aero Design Ltd (MR. E. Burgoin, DAR) has the basket nearly complete (awaiting a couple of fittings). A basket is in Thunder Bay at Wisk Air (C-FBHM is the registration) who are a lead customer. Our file on this project is C-02-0218.

The purpose of the email is determine if your office is willing and able to:

- 1) issue the flight permit - I will forward our conditions
- 2) do the conformity inspection on the aircraft prior to TC Flight Test - Aero Design will have a drawing set forwarded to Wisk Air. (I will advise when this is complete).
- 3) when Flight Test comes out to Thunder Bay to do the TC Flight Tests could an inspector attend to witness these on our behalf. (reference our ACSI 43 for the witness obligations).

I will out of the office tomorrow (June 5th) but back on Thursday and on. I guess we need to talk on this one, determine dates, etc. Hopefully you can support us on this one.

Regards,

J. H. (Jack) Staal
Transport Canada
Aircraft Certification
1100 - 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

voice 780-495-5227
fax 780-495-7963
e-mail: staalj@tc.gc.ca

Tracking:

Recipient
Hochins, Peter
Massicotte, Serge

Delivery

Delivered: 2002/06/04 4:43 PM
Delivered: 2002/06/04 4:43 PM

cc: Aero Design Ltd.
via facs.
June 4/2002
JS.

INVOICE
S159-1-2

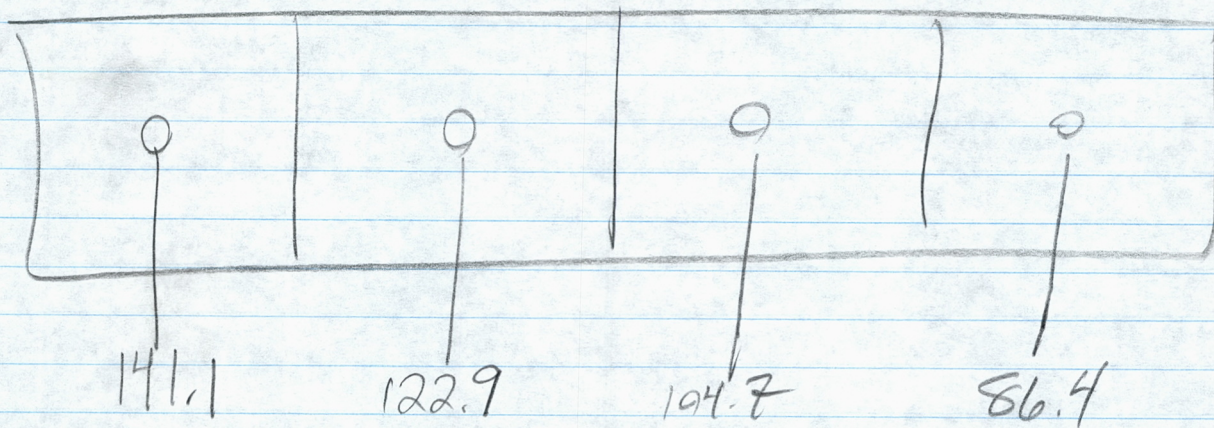
98-99 = DHC-6

GREG, DRYDEN (WISK-AIR)
(807) 937-4111

ALEX, W+B PAPERWORK (ADMIN)

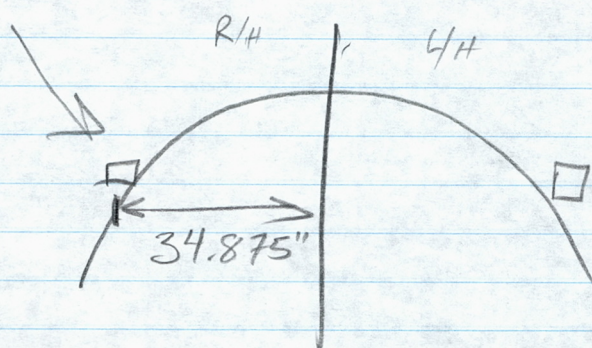
UNDERSUNG UNDER WINGS

JACK 261.02



REMOVE FLITESTEP

LONGITUDINAL 113.5"
LATERAL 34.875"



Notes from
Discussion
with Joel

ADD

Jan 05

Serge Rascoot.

Early July

Jun 24-28th Edmonton
Three used Three.

June 11 12 13

Other Floater Job.

NOT

27.547 - Flight Test Mast Bending

O.K.

Short Format

- Light Aft
- Heavy Fwd.

Compan
Mark Anshuman

Confidential
Therapeutic Bay.

Jun 04

Week 17-21

ACSI
43

Goose
Bay

17-21 IN ALBERTA

Alberta

Now

11th
Early part of
week
Now Tues.

For you
file tell
4m flight Post
after Decord
then T

- Compliance Program.

Initiated
AE-100

} Ted.

- Confidentiality

- Flight Permit

T-shirt Format - Completed

- Company Can Do.

Day/VEP

Night Flight

1401

Anticollision

305

Flight
test

Take-off
Landing

51

75

Flight Permit

- ARE sign out
- 1.1 Vne.
- Populst
-

AERO DESIGN LTD.

1045 McTavish Rd. N.E., Calgary, Alberta, T2E 7G9

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

06 June, 2002

Transport Canada
Aircraft Inspection
100 Princess Street
Suite 201, Thunder Bay Airport
Thunder Bay, Ontario
P7E 6S2

Attn: Dan Maunula

Our File # : 492/493

STC # : SH00-48

Re: Conformity Inspection of Cargo Basket Installation on Bell 206L

Dan,

I have enclosed a complete set of manufacturing and installation drawings for the cargo basket installation. Since the information they contain is proprietary to Aero Design Ltd, I ask that these drawings not be given to Wisk-Air. The operator of the helicopter requires only the two installation drawings to install the basket, although we don't mind if they want to see how it was made, too. When your conformity inspection is complete, please return all of these drawings to Aero Design Ltd. in the envelope I have provided.

The Document Control Lists (enclosed) list all drawings in this package. The installation is performed in two parts: Provisions that replace the landing gear fittings, and subsequent installation of the cargo basket to those provisions. The provisions may remain on the helicopter when the basket is removed. Hence, the drawings are divided into two lists for each stage of the installation.

Contact us with any questions you may have.

Regards,



Steven Fahey, Technologist

~~MAUNULA~~
DAN MAUNULA

807-474-2573

THUNDER BAY

Flight Permit

Company Flight Test.

ACSI 43

100 PRINCESS ST.

SUITE 210

THUNDER BAY AIRPORT

THUNDER BAY, ONT.

P7E 6S2

FAX (807) 475-5816

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 6, 2002

TIME: 4:28 PM

TO: Mark Wiskemann
Wisk-Air

PHONE: 807-475-4510

FAX: 807-473-5485

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 5

RE: FLIGHT MANUAL SUPPLEMENT FOR CARGO BASKET

You will also need the Flight Manual Supplement on board while conducting the flight tests.

Steve

BELL 206L

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN CARGO BASKET**

Supplemental Type Certificate No. SH00-48, Issue 3

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206L when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	4

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (94 kg).
2. Never Exceed Speed (V_{NE}) is limited to 25 KIAS, except when the V_{NE} of the rotorcraft is more restrictive, in which case the lower V_{NE} applies.
3. Maximum lateral or rearward speed is limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing, or hovering flight.
5. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.

TO BE
DETERMINED
BY FLIGHT
TEST

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

III EMERGENCY PROCEDURES

1. No change from basic Approved Flight Manual.

CAUTION

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 knots.

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90,9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

AERO DESIGN LTD.

1045 McTavish Rd. N. E., Calgary, Alberta, T2E 7G9

aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE: June 6, 2002

TIME: 3:37 PM

TO: Mark Wiskemann

PHONE: 807-475-4510

Wisk-Air

FAX: 807-473-5485

FROM: S. Fahey
Aero Design Ltd.

PHONE: 403-250-8027

FAX: 403-250-8333

Number of pages including cover sheet: 2

RE: FLIGHT TEST REPORT FORM

I am faxing you an advance copy of the form, so that you can begin planning for the flight test right away.. A few others are enclosed with the fittings shipment, which you should receive by Monday.

Steve

Transport Canada Limited of Full STC
Simple External Modification – Applicant's Flight Test Report

Aircraft Type: **Bell 206L**

Reg. # / Serial # : **C-FBHM / 45066**

Date of Flight:

Location of Flight:

Takeoff Weight:

Takeoff C of G:

Modification Description: **Installation of External Cargo Basket**

Modification Drawing # : **49201**

List all other external mods: **External Attachment Provisions,**

TEST RESULTS

	TEST	Characteristics to Look For:	Initial if Satisfactory
1	Low Speed Controllability	<ul style="list-style-type: none">- Precise Hovering- Adequate control margins up to 20 MPH estimate airspeed sideward and rearward.	
2	Airspeed Indications	<ul style="list-style-type: none">- Airspeed and altitude indication reliable and steady.- Location of Modification not near pitot or static port: Yes No (Circle one)	
3	Forward Flight out to V_{NE}	<ul style="list-style-type: none">- Determine max. level flight airspeed at MCP.- Control position (margins) and trim characteristics- Conduct turns at V_{NE} both directions- Vibrations- Maximum speed flown: Note: V_{NE} will be 90% of maximum speed flown.	
4	Autorotation	<ul style="list-style-type: none">- Simulated sudden power failures building up from moderate speeds to V_{NE} and autorotation control V_{minROD} and V_{Neuto}	
5	Climbing Flight	<ul style="list-style-type: none">- TOP and MCP, speed from $V_Y - 10$ kias to $1.3 V_Y$- Altitude airspeed and power control	
6	Takeoff and Landing	<ul style="list-style-type: none">- Effect on normal procedures and handling	
7	Miscellaneous	<ul style="list-style-type: none">- System controls, displays and interface- Effect on emergency and normal egress- Flight Manual Supplement for special operating procedures and information- If required, attach report	

I hereby attest that I have flown **Bell 206L**, R/N **C-FBHM**, S/N **45066** with the above modifications installed and that this aircraft exhibited handling qualities and performance characteristics of a standard **Bell 206L** helicopter. Maximum speed attained was IAS. The speed was limited by **basic rotorcraft limit / modification / other**.

Pilot's Signature:

Date:

Pilot's Name:

Pilot's License # :

(If applicable) DAR's Signature:

Date:

DAR's Name: **E. Burgoin**

DAR's Number: **290M**

BILL TO ACCOUNT NO. / N° DE COMPTE À FACTURER 4367155		IMPORTANT - TELEPHONE (403) 250 8027	
SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN LTD		MO DY/JR YR/AN 06/06/02	
STREET ADDRESS / ADRESSE (N° ET RUE) 1045 MCTAVISH RD NE		APT. SUITE / APP. BUREAU	
CITY / VILLE CALGARY		PROV./STATE/ETAT AB	
RECEIVER (TO) / DESTINATAIRE (À) WISK-AIR		POSTAL / ZIP T2E 7G9	
STREET ADDRESS / ADRESSE (N° ET RUE) 304 HECTOR DOUGALL WAY		APT. SUITE / APP. BUREAU	
CITY / VILLE THUNDER BAY ON		PROV./STATE/ETAT P7E 6M6	
ATTN: (NAME / DEPT.) À L'ATTENTION DE (NOM / SERVICE) MARK WISKENANN		IMPORTANT - TELEPHONE 807/754510	
DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) FITTINGS		<input checked="" type="checkbox"/> DG <input type="checkbox"/> MD	
SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD.		PICK UP / CUEILLETTE - N° DE CONF.	
SENDER SIGNATURE / SIGNATURE DE L'EXPÉDITEUR X [Signature]		SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO X	
SHIP MODE / MODE DE TRANSPORT AIR / AÉRIEN <input checked="" type="checkbox"/> GROUND / ROUTIER <input type="checkbox"/>		SHIPMENT / DÉTAILS / EXPÉDITION #Nbre PCS (4 MAXIMUM) 1 WEIGHT / POIDS SUBJ. TO CORR. / SUJET À CORR. 5 KG LB	
PKG / EMBAL SERVICE PURO-LETTER <input type="checkbox"/> 9 AM 9 h <input type="checkbox"/> PURO-PAK <input type="checkbox"/> 10:30 AM 10 h 30 <input type="checkbox"/> OTHER / AUTRE <input checked="" type="checkbox"/> SATURDAY / SAMEDI <input type="checkbox"/>		PAYMENT / PAIEMENT CASH / COMPTANT <input type="checkbox"/> CREDIT CARD / CARTE DE CREDIT <input type="checkbox"/> 3rd PARTY / TIERS <input type="checkbox"/>	
SENDER EXPÉDITEUR <input checked="" type="checkbox"/> RECEIVER DESTINATAIRE <input type="checkbox"/>		DECLARED VALUE / VALEUR DÉCLARÉE (SURCHARGE APPLIES OVER \$100) (SUPPLÉMENT AU-DESSUS DE 100 \$) \$ 5,000 MAX. MAX 5 000 \$	
BILL OF LADING NO. - NOT NEGOTIABLE / N° DE CONNAISSANCE - NON NEGOCIABLE 1491 437 6414		Purolator 1 888 SHIP-123 www.purolator.com	
COURIER INITIALS / INITIALS DU COURRIER [Signature]		COURIER ROUTE / ITINÉRAIRE DU COURRIER 3K1	
MO DY/JR YR/AN 6 6 7		EXP. DATE D'EXP.	
NO. N° TYPE <input type="checkbox"/> VISA <input type="checkbox"/> MC <input type="checkbox"/> AMEX		AMOUNT / MONTANT TOTAL IN TIERS (NOM & ADRESSE) 32165354	
PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES. POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMÉRO DE CONNAISSANCE.			

PACKING SLIP

Address:

27 May, 2002.

06 JUNE

Wisk-Air Helicopters
304 Hector Dougall Way
Thunder Bay, Ontario
P7E 6M6

(807) 475-4510

Attention:

Mark Wiskemann

Reference: Your Purchase Order: 1076

Quantity Ordered	Quantity Shipped	Description	Part Number
1	1	200 Lb Cargo Basket Assembly	49205-01 ✓ C.F.
1	1	Forward Support Beam	49221-01 ✓ C.F.
1	1	Aft Support Beam	49221-02 ✓ C.F.
2	2	Forward External Attachment Fitting	49311-01 ✓
2	2	Aft External Attachment Fitting	49312-01 ✓
4	4	Barrel Nut	49320-01 ✓
5	5	Bolt	AN4-24A ✓
10	10	Washer	AN960JD416 ✓
5	5	Nut	MS21044N4 ✓
5	5	Bolt	AN6-20A ✓
5	5	Washer	AN960JD606 ✓
1	1	Installation Drawing – Cargo Basket	49201 ✓
1	1	Installation Drawing – Fittings	49301 ✓

MAY 27
JUNE 06/02

1

Staal, Jack

From: Staal, Jack
Sent: 2002 June 04 4:43 PM
To: Hochins, Peter
Cc: Massicotte, Serge
Subject: Conformity Inspection, Flight Permit

Hi Peter

I don't believe we have communicated before.

I have a project involving a cargo basket for the Bell 206L series. The project needs to be flight tested. I have tentatively reserved the week of June 17th for flight testing by an Ottawa test pilot (exact day yet to be determined). This is subject to the conformity inspection being completed, a flight permit being in place, witness being available per ACSI 43. I still have some work to do on the engineering review as well, but I expect all this will come together.

Aero Design Ltd (MR. E. Burgoin, DAR) has the basket nearly complete (awaiting a couple of fittings). A basket is in Thunder Bay at Wisk Air (C-FBHM is the registration) who are a lead customer. Our file on this project is C-02-0218.

The purpose of the email is determine if your office is willing and able to:

- 1) issue the flight permit - I will forward our conditions
- 2) do the conformity inspection on the aircraft prior to TC Flight Test - Aero Design will have a drawing set forwarded to Wisk Air. (I will advise when this is complete).
- 3) when Flight Test comes out to Thunder Bay to do the TC Flight Tests could an inspector attend to witness these on our behalf. (reference our ACSI 43 for the witness obligations).

I will out of the office tomorrow (June 5th) but back on Thursday and on. I guess we need to talk on this one, determine dates, etc. Hopefully you can support us on this one.

Regards,

J. H. (Jack) Staal
Transport Canada
Aircraft Certification
1100 - 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

voice 780-495-5227
fax 780-495-7963
e-mail: staalj@tc.gc.ca

Tracking:
Recipient
Hochins, Peter
Massicotte, Serge

Delivery
Delivered: 2002/06/04 4:43 PM
Delivered: 2002/06/04 4:43 PM

cc: Aero Design
via facs.

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	June 4, 2002	TIME:	4:06 PM
TO:	Mr. Jack Staal	PHONE:	780-495-5227
	Tranport Canada	FAX:	780-495-7963
FROM:	S. Fahey	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 4

RE: COMPLIANCE PROGRAM FOR CARGO BASKET

Revision 3, of course.

Steve.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart C – Strength Requirements						
27.301	24	Loads – Air Drag Loads	Analysis		X	
27.301	24	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X	
27.303	24	Factor of Safety	Analysis		X	
27.305	24	Strength and Deformation	Analysis and Test iaw AC 43.13-1A		X	
27.307	28	Proof of Structure	Analysis and Test iaw AC 43.13-1A		X	
27.337(a)	28	Limit Maneuvering Load Factor – Positive (3.5g)	Analysis and Test iaw AC 43.13-1A		X	Critical load factor in downward direction.
27.547	24	Main Rotor Structure	Flight Test	X		Proposed V _{NE} limitation. Assymmetric drag may impose bending load on mast.
27.561	24	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(i)	24	Emergency Landing Conditions – Up (1.5g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd (4.0g)	N/A			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24	Emergency Landing Conditions – Side (2.0g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down 4.0g)	Compliance with 27.337		X	27.337 Maouvering Load is Critical.
Subpart D – Design and Construction						
27.601	24	Design	Drawings		X	Design is conventional.
27.603	24	Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5H.
27.605	24	Fabrication Methods	Drawings		X	Design is conventional.
27.609	24	Protection of Structure	Drawings		X	
27.611	24	Inspection Provisions	Drawings		X	Design is easy to inspect.
27.613	28	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H		X	
27.625	24	Fitting Factor	Analysis		X	
27.783	28	Doors	N/A			Installation does not block doors.
27.787(a)	24	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	
27.787(b)	24	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
27.787(c), (d)	24	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, Alberta, T2E 7G9

DATE: 12 March, 2002
REV. No. 3 4 June, 2002

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
27.27	24 Centre of Gravity Limits	N/A			No change from Type Approval.
27.29	24 Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
27.51	24 Takeoff	Flight Test	X		Determine ROC at V _y . Determine ROD in autorotation.
27.65	24 Climb: All Engines Operating	Flight Test	X		
27.71	24 Gliding Performance	Flight Test	X		
27.75	24 Landing	Flight Test	X		
27.141	20 Flight Characteristics – General	Flight Test	X		
27.143	1 Controllability and Maneuverability	Flight Test	X		
27.151	24 Flight controls	Flight Test	X		
27.161	24 Trim	Flight Test	X		
27.171	24 Stability – General	Flight Test	X		
27.173	1 Longitudinal Stability	Flight Test	X		
27.175	1 Demonstration of Longitudinal Stability	Flight Test	X		
27.251	24 Vibration	Flight Test	X		

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
27.807	28	Emergency Exits	N/A		X	Installation does not block doors.
27.865(a)	28	External Load Attaching Means	Compliance with 27.337		X	
27.865(b), (c)	28	External Load Attaching Means	N/A			
27.865(d)	28	External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	24	Position Light System Dihedral Angles	N/A			No change from Type Approval.
27.1401	24	Anticollision Light System	Statement	X		Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect visibility of anticollision light.
Subpart G – Operating Limitations and Information						
27.1505	24	Never Exceed Speed	Flight Test,	X		0.9 V _d that can be achieved in flight test with basket installed, if less than basic V _{ne} .
27.1525	24	Kinds of Operation	Flight Manual Supplement (if req'd)	X		Limited to VFR only.
27.1529	24	Instructions for Continuing Airworthiness	Flight Manual Supplement	X		
			Maintenance Manual Supplement	X		
27.1557(a)	24	Miscellaneous Markings and Placards – Baggage Compartments	Placard		X	
27.1557(b)	24	Miscellaneous Markings and Placards	N/A			
27.1557(c)	24	Miscellaneous Markings and Placards	N/A			
27.1557(d)	24	Miscellaneous Markings and Placards	N/A			
27.1581	24	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
27.1583(c)	24	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
27.1585	1	Operating Procedures	Flight Manual Supplement	X		
27.1587	1	Performance Information	Flight Test,	X		Effect (if any) of basket installation on performance.
			Flight Manual Supplement (if req'd)	X		
27.1589	24	Loading Information	Flight Manual Supplement & Placard	X		Placard installed on basket lid and beams.
Airworthiness Manual Requirements						
527.1581(e)		Rotorcraft Flight Manual – Units	SI and Imperial Units provided in Flight Manual Supplement	X		

From :

PHONE No. : 00

Jun. 04 2002 3:06PM P01

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

FAX COVER SHEET

DATE:	June 4, 2002	TIME:	3:05 PM
TO:	Mr. Jack Staal	PHONE:	780-495-5227
	Transport Canada	FAX:	780-495-7963
FROM:	E. Burgoin	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 4

RE: COMPLIANCE PROGRAM FOR CARGO BASKET

Revision 2, added 27.547, as you originally requested.

Ted.

Ted
Could you add 27.305
Thanks
Jack.

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	June 4, 2002	TIME:	3:05 PM
TO:	Mr. Jack Staal	PHONE:	780-495-5227
	Tranport Canada	FAX:	780-495-7963
FROM:	E. Burgoin	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 4

RE: COMPLIANCE PROGRAM FOR CARGO BASKET

Revision 2, added 27.547, as you originally requested.

Ted.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, Alberta, T2E 7G9

DATE: 12 March, 2002
REV. No. 2 4 June, 2002

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
27.27	24	Centre of Gravity Limits	N/A		No change from Type Approval.
27.29	24	Empty Weight and Corresponding C of G	Data specified on inst'n drawing	X	
27.51	24	Takeoff	Flight Test	X	Determine ROC at V _y . Determine ROD in autorotation.
27.65	24	Climb: All Engines Operating	Flight Test	X	
27.71	24	Gliding Performance	Flight Test	X	
27.75	24	Landing	Flight Test	X	
27.141	20	Flight Characteristics – General	Flight Test	X	
27.143	1	Controllability and Maneuverability	Flight Test	X	
27.151	24	Flight controls	Flight Test	X	
27.161	24	Trim	Flight Test	X	
27.171	24	Stability – General	Flight Test	X	
27.173	1	Longitudinal Stability	Flight Test	X	
27.175	1	Demonstration of Longitudinal Stability	Flight Test	X	
27.251	24	Vibration	Flight Test	X	

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart C – Strength Requirements						
27.301	24	Loads – Air Drag Loads	Analysis		X	
27.301	24	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X	
27.303	24	Factor of Safety	Analysis		X	
27.307	28	Proof of Structure	Analysis and Test iaw AC 43.13-1A		X	
27.337(a)	28	Limit Maneuvering Load Factor – Positive (3.5g)	Analysis and Test iaw AC 43.13-1A		X	Critical load factor in downward direction.
27.547	24	Main Rotor Structure	Flight Test	X		Proposed V _{NE} limitation. Assymmetric drag may impose bending load on mast.
27.561	24	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(i)	24	Emergency Landing Conditions – Up (1.5g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd (4.0g)	N/A			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24	Emergency Landing Conditions – Side (2.0g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down 4.0g)	Compliance with 27.337		X	27.337 Maouvering Load is Critical.
Subpart D – Design and Construction						
27.601	24	Design	Drawings		X	Design is conventional.
27.603	24	Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5H.
27.605	24	Fabrication Methods	Drawings		X	Design is conventional.
27.609	24	Protection of Structure	Drawings		X	
27.611	24	Inspection Provisions	Drawings		X	Design is easy to inspect.
27.613	28	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H		X	
27.625	24	Fitting Factor	Analysis		X	
27.783	28	Doors	N/A			Installation does not block doors.
27.787(a)	24	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	
27.787(b)	24	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
27.787(c), (d)	24	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
27.807	28	Emergency Exits	N/A		X	Installation does not block doors.
27.865(a)	28	External Load Attaching Means	Compliance with 27.337		X	
27.865(b), (c)	28	External Load Attaching Means	N/A			
27.865(d)	28	External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	24	Position Light System Dihedral Angles	N/A			No change from Type Approval.
27.1401	24	Anticollision Light System	Statement	X		Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect visibility of anticollision light.
Subpart G – Operating Limitations and Information						
27.1505	24	Never Exceed Speed	Flight Test,	X		0.9 V_d that can be achieved in flight test with basket installed, if less than basic V_{ne} .
27.1525	24	Kinds of Operation	Flight Manual Supplement (if req'd)	X		Limited to VFR only.
27.1529	24	Instructions for Continuing Airworthiness	Flight Manual Supplement	X		
			Maintenance Manual Supplement	X		
27.1557(a)	24	Miscellaneous Markings and Placards – Baggage Compartments	Placard		X	
27.1557(b)	24	Miscellaneous Markings and Placards	N/A			
27.1557(c)	24	Miscellaneous Markings and Placards	N/A			
27.1557(d)	24	Miscellaneous Markings and Placards	N/A			
27.1581	24	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
27.1583(c)	24	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
27.1585	1	Operating Procedures	Flight Manual Supplement	X		
27.1587	1	Performance Information	Flight Test,	X		Effect (if any) of basket installation on performance.
			Flight Manual Supplement (if req'd)	X		
27.1589	24	Loading Information	Flight Manual Supplement & Placard	X		Placard installed on basket lid and beams.
Airworthiness Manual Requirements						
527.1581(e)		Rotorcraft Flight Manual – Units	SI and Imperial Units provided in Flight Manual Supplement	X		

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	June 4, 2002	TIME:	10:06 AM
TO:	Mr. Jack Staal	PHONE:	780-495-5227
	Tranport Canada	FAX:	780-495-7963
FROM:	E. Burgoin	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 4

RE: COMPLIANCE PROGRAM FOR CARGO BASKET

Revision 1, as requested per telecon this AM.

Ted.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, Alberta, T2E 7G9

DATE: 12 March, 2002
REV. No. 1 4 June, 2002

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
27.27	24 Centre of Gravity Limits	N/A			No change from Type Approval.
27.29	24 Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	
27.51	24 Takeoff	Flight Test	X		
27.65	24 Climb: All Engines Operating	Flight Test	X		Determine ROC at V _y .
27.71	24 Gliding Performance	Flight Test	X		Determine ROD in autorotation.
27.75	24 Landing	Flight Test	X		
27.141	20 Flight Characteristics – General	Flight Test	X		
27.143	1 Controllability and Maneuverability	Flight Test	X		
27.151	24 Flight controls	Flight Test	X		
27.161	24 Trim	Flight Test	X		
27.171	24 Stability – General	Flight Test	X		
27.173	1 Longitudinal Stability	Flight Test	X		
27.175	1 Demonstration of Longitudinal Stability	Flight Test	X		
27.251	24 Vibration	Flight Test	X		

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart C – Strength Requirements						
27.301	24	Loads – Air Drag Loads	Analysis		X	
27.301	24	Loads – Inertia Loads	Compliance with 27.337 and 27.561		X	
27.303	24	Factor of Safety	Analysis		X	
27.307	28	Proof of Structure	Analysis and Test iaw AC 43.13-1A		X	
27.337(a)	28	Limit Maneuvering Load Factor – Positive (3.5g)	Analysis and Test iaw AC 43.13-1A		X	Critical load factor in downward direction.
27.561	24	Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(i)	24	Emergency Landing Conditions – Up (1.5g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(ii)	24	Emergency Landing Conditions – Fwd (4.0g)	N/A			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24	Emergency Landing Conditions – Side (2.0g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(iv)	24	Emergency Landing Conditions – Down 4.0g)	Compliance with 27.337		X	27.337 Maouvering Load is Critical.
Subpart D – Design and Construction						
27.601	24	Design	Drawings		X	Design is conventional.
27.603	24	Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5H.
27.605	24	Fabrication Methods	Drawings		X	Design is conventional.
27.609	24	Protection of Structure	Drawings		X	
27.611	24	Inspection Provisions	Drawings		X	Design is easy to inspect.
27.613	28	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H		X	
27.625	24	Fitting Factor	Analysis		X	
27.783	28	Doors	N/A			Installation does not block doors.
27.787(a)	24	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	
27.787(b)	24	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
27.787(c), (d)	24	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.
27.807	28	Emergency Exits	N/A		X	Installation does not block doors.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
27.865(a)	28	External Load Attaching Means	Compliance with 27.337		X	
27.865(b), (c)	28	External Load Attaching Means	N/A			
27.865(d)	28	External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	24	Position Light System Dihedral Angles	N/A			No change from Type Approval.
27.1401	24	Anticollision Light System	Statement	X		Light located at FS 396, WL 130 on vertical fin. Basket has no significant effect visibility of anticollision light.
Subpart G – Operating Limitations and Information						
27.1505	24	Never Exceed Speed	Flight Test,	X		0.9 V_d that can be achieved in flight test with basket installed, if less than basic V_{ne} .
27.1525	24	Kinds of Operation	Flight Manual Supplement (if req'd)	X		Limited to VFR only.
27.1529	24	Instructions for Continuing Airworthiness	Flight Manual Supplement	X		
			Maintenance Manual Supplement	X		
27.1557(a)	24	Miscellaneous Markings and Placards – Baggage Compartments	Placard		X	
27.1557(b)	24	Miscellaneous Markings and Placards	N/A			
27.1557(c)	24	Miscellaneous Markings and Placards	N/A			
27.1557(d)	24	Miscellaneous Markings and Placards	N/A			
27.1581	24	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
27.1583(c)	24	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
27.1585	1	Operating Procedures	Flight Manual Supplement	X		
27.1587	1	Performance Information	Flight Test,	X		Effect (if any) of basket installation on performance.
			Flight Manual Supplement (if req'd)	X		
27.1589	24	Loading Information	Flight Manual Supplement & Placard	X		Placard installed on basket lid and beams.
Airworthiness Manual Requirements						
527.1581(e)		Rotorcraft Flight Manual – Units	SI and Imperial Units provided in Flight Manual Supplement	X		

From
Staal, Jack

Transport Canada

TO:
STEVE FAHEY

From: Wright, Fred
Sent: 2002 January 24 4:47 PM
To: David Austen; Dennis Hoepfner; Gregory Oucharek; Hugh Martin; Jack Staal; Ken David; Linda Van de Mosselaer; Marc Malo; Robert Ferguson
Subject: FW: "Mast Bending"

Aero Design Ltd.

Hi,

The issue of helicopter "mast bending" caused by external loads was raised this morning at the ACMT. The attached e-mail provides guidance on this matter and should be shared with your applicants and actively distributed to delegates. Until the appropriate Canadian guidance material is published, please use the following guidelines.

Regards,

Fred. Wright

Regional Manager, Aircraft Certification
Transport Canada Civil Aviation
Prairie & Northern Region
(780) 495-3856 phone
(780) 495-7963 FAX

From: Gretton, Tom
Sent: Thursday, January 24, 2002 9:46 AM
To: Bill Jupp (E-mail); Bohdan Goyaniuk (E-mail); Chief, Engineering (A/AARDD); Frank Davies (E-mail); Maher Khouzam (E-mail); Martin Eley (E-mail); McKaskle, Suzette; Peter Cowling (E-mail); Ereaux, John; Fortler, Richard; Goossens, Roger; Nehera, John; O'Reilly, Shaun; Wright, Fred
Subject: FW: "Mast Bending"

Attached is the e-mail that was distributed to our clients in the Ontario region on the subject.

Tom

-----Original Message-----

From: Gretton, Tom
Sent: Tuesday 07 August 2001 14:42
Subject: "Mast Bending"

As this is an important issue affecting many projects in process that won't wait until the next newsletter...

There has been an ongoing discussion in both Transport Canada and the FAA on the effect of external modifications to rotorcraft and fatigue of the helicopter dynamic components and, in particular, the moment on the mast.

As a result, many applicants for approval of projects involving external modifications have been asked to address 'mast bending'.

The following procedure was initiated by the FAA Fort Worth Aircraft Certification Office and is accepted, with variation, in Canada as an alternate to a full assessment of the moment imposed on the mast whenever an external modification is to be incorporated.

Background

As a means of limiting mast moment to the values contemplated in the original static and fatigue design, the criterion proposes a limitation in displacement of the cyclic control. Once such limitation has been established, because it cannot be observed in the form of inches of displacement, it will be given to the pilot in the form of a corresponding speed limitation.

Procedure

Under identical conditions of weight, center of gravity position, torque (power), density altitude, etc.:

With the helicopter in the clean, unmodified configuration, establish a condition of flight at V_{ne}(power-on) as

published in the Approved Flight Manual and applicable Flight Manual Supplements. Mark the position reached by the cyclic control.

With the helicopter in the modified (draggy) configuration, establish a condition of powered flight where the cyclic control is in the same position as previously marked and read the new speed.

Adopt as the new, reduced Vne(power-on), 90% of the resulting speed.

This procedure will be incorporated into the Flight Test Card for Simple Rotorcraft External Modifications.

Notwithstanding the above procedure, projects involving larger or more complex external modifications may necessitate a full fatigue evaluation of the rotorcraft dynamic components. The suitability of this flight test procedure should be discussed with Transport Canada at the beginning of the project.

Analytical methods involving "comparative Vne reduction" or "cruise speed reduction" are not accepted methods.

Tom Gretton
A/Regional Manager Aircraft Certification
Ontario Region

b: 416.952.0328
f: 416.952.0370
c: 416.433.1969

Steve: As promised in telecon yesterday.
This was also emailed to Aero
Design Ltd back in January.

Regards,

J. Staal.

[- Murtin
- Georgie]

8332

May 27 02 01:26p

Hélicraft 2000 Inc.
 6500 chemin de la Savane
 St-Hubert (Québec)
 J3Y 5K2
 Tel.: (450) 468-3431
 Fax : (450) 468-5497

Date : _____
 À/To : _____
 Compagnie/Company : HERO DESIGN
 N° de fax/Fax N° : 512. BURGON
 De/From : 403 250 8333
DANIEL HALLER

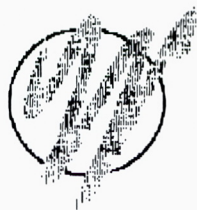
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Fax: (807) 473-5485
info@wiskair.com

Purchase Order 1076

Order Date	27/05/02	Employee	Wiskemann, Mark
Purchase Order #	1076	Ship Via	Best Way
Date Required		Notes:	
Date Promised			

Ordered From: E. Burgoin
Aero Design
1045 McTavish Rd. N.E.
Calgary, AB T2E 7G9
Canada

Phone 4032508027

Fax: 4032508333

Part Number	Product Description	Quantity	Unit Price	Subtotal
49201	LONG RANGER CARGO BASKET	1	\$8,000.00	\$8,000.00
Order Total (Exclusive Of Tax And Shipping)				\$8,000.00

PER BASKET

INSTALLATION

-5A					
AN3- 14A	1	AN960-10	3 + 12	21044N3	1
AN3-14A	6 + 1	AN960-10L	12 + 1		7
AN3-17A	1	AN960-10	1		1
		AN970-10	2		
AN4-24A	4	AN960-416	8	21044N4	4
AN6-20A	4	AN960-616	4		

CR3213-4-03 26

	(1)	(4)	ORDER REQ'D
AN3-5A	1	4	10
AN3-14A	7	28	50
AN3-17A	1	4	10
AN4-24A	4	16	25
AN6-20A	4	16	25
AN960-10	5	20	50
-10L	13	52	100
-416	8	32	50
-616	4	16	50
AN970-10	2	8	50
MS21044N3	9	36	50
-N4	4	16	25
CR3213-4-03	26	104	200



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Owner name	Mark	Common Name	Model	Own
1 Helicraft 2000 Inc.	C-FHLL	Schweizer	269C-1	2001-
2 Helicraft 2000 Inc.	C-FLIZ	Aerospatiale	AS 350 BA	2001-
3 Helicraft 2000 Inc.	C-FRJA	Robinson	R22 BETA	2002-
4 Helicraft 2000 Inc.	C-FZQF	Schweizer	269C-1	2001-
5 Helicraft 2000 Inc.	C-GARE	Bell	206B	2001-
6 Helicraft 2000 Inc.	C-GCVL	Hughes	269C	2001-
7 Helicraft 2000 Inc.	C-GHLJ	Schweizer	269C-1	2000-
8 Helicraft 2000 Inc.	C-GHNW	Schweizer	269C-1	2001-
9 Helicraft 2000 Inc.	C-GHQA	Schweizer	269C	2001-
10 Helicraft 2000 Inc.	C-GKHX	Bell	206L	2002-
11 Helicraft 2000 Inc.	C-GKJO	Robinson	R22 BETA	2002-
12 Helicraft 2000 Inc.	C-GLTM	Hughes	269C	2001-
13 Helicraft 2000 Inc.	C-GMIX	Robinson	R44	2001-
14 Helicraft Ltd./Helicraft Ltee	C-FWIN	Hughes	269B	1983-

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<i>Mark</i>	C-GKHX	<i>Serial No</i>	4661
<i>Common Name</i>	Bell	<i>Model</i>	206L
<i>Industry Name(s)</i>	206L-1 , 206L-2 , 206L-3 , BELL HELICOPTER , LONG RANGE RANGER , TEXTRON		
<i>Base Of Op. - Country</i>	CANADA		
<i>Base Of Op. - Location</i>	St-Hubert		
<i>File Location</i>	Dorval	<i>Basis for Eligibility for Registration</i>	Type H92
<i>Reg Purpose</i>	Commercial	<i>Flight Authority</i>	Certif Airw
<i>Category</i>	Helicopter	<i>Weight (Kgs)</i>	1814
<i>Manufacturer</i>	Bell Helicopter Textron Division Of Textron Inc.		
<i>Year of Manufacture</i>	1978	<i>Year Imported</i>	2002
<i>Country of Manufacture</i>	CANADA		

Owner Registration

<i>Owner Registered Since</i>	2002-04-09	<i>Last Certificate of Registration Issued</i>	2002
<i>Engine</i>	Turbo Shaft	<i>Number of Engines</i>	1

Owner Information

<i>Name (1 of 1)</i>	Helicraft 2000 Inc.	<i>Mail Recipient</i>
<i>Address</i>	6500 Chemin De La Savane	
<i>City</i>	St-Hubert	<i>Province</i>
<i>Postal Code</i>	J3Y 5K2	<i>Region</i>

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Owner name	Mark	Common Name	Model	Ow
1 Taiga Air Services Ltd.	C-FJPL	Bell	206L-1	2000
2 Taiga Air Services Ltd.	C-GSUL	Bell	206A	1998
3 Taiga Educational Associates I	C-GQXB	Piper	PA-22-150	2000
4 Taiga Helicopters (1993) Ltd	C-FAXU	Bell	206B	1993
5 Taiga Helicopters (1993) Ltd	C-FPHN	Aerospatiale	AS 350D	2000
6 Taiga Helicopters (1993) Ltd	C-GAOG	Bell	206B	1997
7 Taiga Helicopters (1993) Ltd	C-GFSO	Bell	206B	1997

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Current Information, directly from the Official Canadian Civil Aircraft Register

Mark	C-FJPL	Serial No	45747
Common Name	Bell	Model	206L-1
Industry Name(s)	206 , 206L , BELL HELICOPTER , LONG RANGER , TEXTR		
Base Of Op. - Country	CANADA		
Base Of Op. - Province	Manitoba		
Base Of Op. - Location	Winnipeg		
File Location	Winnipeg	Basis for Eligibility for Registration	Type Ce
Reg Purpose	Commercial	Flight Authority	Certifica
Category	Helicopter	Weight (Kgs)	Airworth
Manufacturer	Bell Helicopter Textron		1837
Year of Manufacture	1982	Year Imported	1994
Country of Manufacture	U.S.A.		

Owner Registration

Owner Registered Since	2000-05-04	Last Certificate of Registration Issued	2000-05
Engine	Turbo Shaft	Number of Engines	1

Owner Information

Name (1 of 1)	Taiga Air Services Ltd.	Mail Recipient	Yes
Address	155 West Hangar Road		
City	Winnipeg	Province	Manitoba
Postal Code	R3J 3Z1	Region	Prairie and

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Current Information, directly from the Official Canadian Civil Aircraft Register

Owner name	Mark	Common Name	Model	Owner Reg
1 Wisk-Air Limited	C-FBHM	Bell	206L	2000-08-25
2 Wisk-Air Limited	C-GEKM	Bell	206B	2000-05-19

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Current Information, directly from the Official Canadian Civil Aircraft Register

Mark	C-FBHM	Serial No	45066
Common Name	Bell	Model	206L
Industry Name(s)	206L-1 , 206L-2 , 206L-3 , BELL HELICOPTER , LONG RAN RANGER , TEXTRON		
Base Of Op. - Country	CANADA		
Base Of Op. - Province	Ontario		
Base Of Op. - Location	Thunder Bay		
File Location	Toronto	Basis for Eligibility for Registration	Type Ce
Reg Purpose	Commercial	Flight Authority	Certifica Airworth
Category	Helicopter	Weight (Kgs)	1814
Manufacturer	Bell Helicopter Textron		
Year of Manufacture	1976	Year Imported	1988
Country of Manufacture	U.S.A.		

Owner Registration

Owner Registered Since	2000-08-25	Last Certificate of Registration Issued	2000-08
Engine	Turbo Shaft	Number of Engines	1

Owner Information

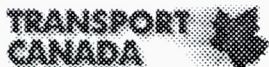
Name (1 of 1)	Wisk-Air Limited	Mail Recipient
Address	304 Hector Dougal Way	
City	Thunder Bay	Province
Postal Code	P7E 6M6	Region

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Owner name	Mark	Common Name	Model	Owner
1 Airspan Helicopters Ltd	C-FOUA	Hughes	369D	2000-08-0
2 Airspan Helicopters Ltd	C-FVSP	Bell	206B	2001-10-2
3 Airspan Helicopters Ltd	C-GGSI	Hughes	369D	2001-01-0
4 Airspan Helicopters Ltd	C-GVIW	Bell	206L-1	1999-05-2

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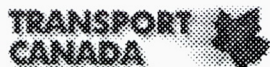
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Current Information, directly from the Official Canadian Civil Aircraft Register

<i>Mark</i>	C-GVIW	<i>Serial No</i>	45410
<i>Common Name</i>	Bell	<i>Model</i>	206L-1
<i>Industry Name(s)</i>	206 , 206L , BELL HELICOPTER , LONG RANGER , TEXTR		
<i>Base Of Op. - Country</i>	CANADA		
<i>Base Of Op. - Province</i>	British Columbia		
<i>Base Of Op. - Location</i>	Sechelt		
<i>File Location</i>	Vancouver	<i>Basis for Eligibility for Registration</i>	Type Cer
<i>Reg Purpose</i>	Commercial	<i>Flight Authority</i>	Certificat Airworthi
<i>Category</i>	Helicopter	<i>Weight (Kgs)</i>	1837
<i>Manufacturer</i>	Bell Helicopter		
<i>Year of Manufacture</i>	1980		
<i>Country of Manufacture</i>	U.S.A.		

Owner Registration

Owner Registered Since	1999-05-26	Last Certificate of Registration Issued	1999-05-
Engine	Turbo Shaft	Number of Engines	1

Owner Information

<i>Name</i> (1 of 1)	Airspan Helicopters Ltd	<i>Mail Recipient</i>	Yes
<i>Address</i>	Box 1009		
<i>City</i>	Sechelt	<i>Province</i>	British C
<i>Postal Code</i>	V0N 3A0	<i>Region</i>	Pacific

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AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	May 21, 2002	TIME:	8:30 AM
TO:	Mr. Jack Staal	PHONE:	780-495-5227
	Tranport Canada	FAX:	780-495-7963
FROM:	E. Burgoin	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 2

RE: SUBMISSION OF DATA: BELL 206L CARGO BASKET

Jack,

I put a package on the Greyhound courier yesterday, that should arrive at your office early this morning, containing the following:

Document Control List	DCL492	Rev. 0
Flight Manual Supplement	FMS492.01	Rev. 0
Installation Drawing	49201	Rev. 0
Assembly Drawing	49205	Rev. 0
Assembly Drawing	49207	Rev. 0
Assembly Drawing	49208	Rev. 0
Assembly Drawing	49209	Rev. 0
Fabrication Drawing	49210	Rev. 0
Fabrication Drawing	49211	Rev. 0
Fabrication Drawing	49212	Rev. 0
Fabrication Drawing	49213	Rev. 0
Fabrication Drawing	49214	Rev. 0
Fabrication Drawing	49215	Rev. 0
Fabrication Drawing	49216	Rev. 0
Fabrication Drawing	49217	Rev. 0

Fabrication Drawing	49218	Rev. 0
Fabrication Drawing	49221	Rev. 0
Assembly Drawing	36255	Rev. 0
Assembly Drawing	36261	Rev. 0
Assembly Drawing	36262	Rev. 0
Fabrication Drawing	36271	Rev. 0
Fabrication Drawing	36272	Rev. 0
Fabrication Drawing	36273	Rev. 0
Fabrication Drawing	36274	Rev. 0
Fabrication Drawing	36275	Rev. 0
Fabrication Drawing	36276	Rev. 0
Fabrication Drawing	36277	Rev. 0
Fabrication Drawing	36278	Rev. 0
Fabrication Drawing	36280	Rev. 0

The way-bill number for this package is #71064991771.

Hope you can receive it before you leave.

Regards,

Ted.

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
49201	Cargo Basket Installation	0
FABRICATION DOCUMENTS		
49205	Cargo Basket Assembly	0
49207	Cargo Basket Lid	0
49208	Cargo Basket Body	0
49209	End Hoop Assembly	0
49210	Basket Components – Hoops	0
49211	Basket Components – Rim	0
49212	Basket Components – Rim	0
49213	Basket Components – Lid Brace	0
49214	Basket Components – Spine	0
49215	Basket Components – Spacer	0
49216	Basket Components – Spacer	0
49217	Basket Components – Lug	0
49218	Placard	0
49221	Support Beams	0
36255	Handle Assembly	0
36261	Handle Bar Assembly	0
36262	Handle Bracket Assembly	0
36271	Handle Lever	0
36272	Basket Bracket	0
36273	Lid Bracket	0
36274	Bushing	0
36275	Bushing	0
36276	Spring Hook	0
36277	Handle Bar	0
36278	Spring	0
36280	Brace	0
ENGINEERING DOCUMENTS		
ER492.01	Engineering Report – Basket Installation	0
ER492.02	Engineering Report – Basket Load Tests	0
FMS492.01	Flight Manual Supplement	0
APPROVAL:	ORIGINAL DATE: 17 May, 2002	AERO DESIGN LTD. 1045 McTavish Rd. NE Calgary, Alberta T2E 7G9 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE:	
	SHEET 1 OF 1	BELL 206L SERIES Side-Mounted Cargo Basket Installation
	<div>Rev.</div> <div>DCL492</div> <div>0</div>	

BELL 206L

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN CARGO BASKET**

Supplemental Type Certificate No. SH00-48, Issue 3

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206L when fitted with the Cargo Basket. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	4

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Cargo Basket is 200 Lb. (94 kg).
2. Never Exceed Speed (V_{NE}) is limited to ____ KIAS, except when the V_{NE} of the rotorcraft is more restrictive, in which case the lower V_{NE} applies.
3. Maximum lateral or rearward speed is limited to 25 KIAS.
4. Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing, or hovering flight.
5. Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket does not extend outside the basket, is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.

III EMERGENCY PROCEDURES

1. No change from basic Approved Flight Manual.

CAUTION

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

Climb performance may be reduced by up to 200 fpm.

Cruise speeds are reduced by approximately 10 knots.

V WEIGHT AND BALANCE

English Units

Item	Weight (Lb)	Longitudinal		Lateral	
		Arm (in)	Moment (in*Lb)	Arm (in)	Moment (in*Lb)
Cargo Basket Installation	66.0	113.3	7476	30.5	2013
Cargo	200 (MAX)	114.1	22820	38.5	7700

Metric Units

Item	Weight (Kg)	Longitudinal		Lateral	
		Arm (mm)	Moment (mm*Kg)	Arm (mm)	Moment (mm*Kg)
Cargo Basket Installation	30,0	2878	86 314	775	23 241
Cargo	90,9 (MAX)	2898	263 467	978	88 900

Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

BELL 407 HELICOPTER
ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
for the
INSTALLATION OF AERO Design Ltd. CARGO BASKET

Supplemental Type Approval No. SH00-48

Sections I, II, III and IV of this Flight Manual Supplement comprise the Transport Canada Approved sections. Compliance with Section I, Limitations, is mandatory.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Rotorcraft Flight Manual for the Bell 407 Helicopter, when the AERO Design Ltd. Cargo Basket is installed. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Rotorcraft Flight Manual and other approved Flight Manual Supplements.

I LIMITATIONS

1 The maximum load in AERO Design Ltd. Cargo Basket is limited to 150 lb (94 kg.) for installation 36201-01-150 with basket support arms 36203-03 and 36203-04 installed. (See Placard installed on basket lid.)

The maximum load in AERO Design Ltd. Cargo Basket is limited to 200 lb (125 kg.) for installation 36201-01-200 with basket support arms 36203-01 and 36203-02 installed. (See Placard installed on basket lid.)

2 Maximum speed for lateral or rearward is limited to 25 KIAS.

3 Maximum winds from aft quadrants limited to 25 KIAS for takeoff, landing or hovering flight.

4 Flight operations limited to VFR conditions with AERO Design Ltd. Cargo Basket installed.

5 V_{NE} is 140 KIAS except when V_{NE} of basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.

An approved emergency exit "push-out" window must be installed in the right side passenger door if passengers are carried in the cabin.

II NORMAL PROCEDURES

- Preflight -
- a) Advise all passengers seated in the aft cabin compartment that the right hand passenger compartment door is in-operative for normal entry and exit due to the cargo basket installation.
 - b) Advise all passengers seated in the aft cabin compartment of the right hand side emergency exit "push-out" window.
 - c) Ensure that cargo stowed in the Cargo Basket does not extend outside the basket, is properly tied down and secured prior to flight.
 - d) Ensure that the lid on the cargo basket is closed and secured.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Airplane Flight Manual.

CAUTION

The helicopter glide angle is steeper than that of the basic helicopter with the AERO Design Ltd. Cargo Basket installed.

IV PERFORMANCE

Rotorcraft climb performance may be reduced by up to 200 fpm and cruise speeds are reduced by approximately 10 kts. (11 mph) with the AERO Design Ltd. Cargo Basket installed.

V WEIGHT AND BALANCEEnglish Units

Item	Weight	Longitudinal Arm	Longitudinal Moment	Lateral Arm	Lateral Moment
Cargo Basket Installation					
Right side installation	76 lb.	113.4"	8,619 lb-in	+33.8"	2,568 lb-in
Cargo* (Maximum Load in Basket)					
Right side installation Installation 36201-01-150 See PLACARD on cargo basket lid	150 lb.	133.25" (centred)	19,988 lb-in	+42.13"	6,320 lb-in
Right side installation Installation 36201-01-200 See PLACARD on cargo basket lid	200 lb.	133.25" (centred)	26,650 lb-in	+42.13"	8,426 lb-in

* Longitudinal and Lateral moment arms are given for the centre of the cargo basket. Due to the length of the AERO Design Ltd. Cargo Basket, specific cargo and loading may require that actual moment arms be measured in order to determine correct CofG moments.

ASA ALLOYS - (780) 917-0513

SOUTHERN TUBE & FITS - 236-2216

5/16 - 0.049 - 0.068 → ID = 0.314 - 0.340
~~5/16 - 0.049 - 0.068 → ID = 0.314 - 0.340~~
 5/16 - 0.049 - 0.068 → ID = 0.314 - 0.340

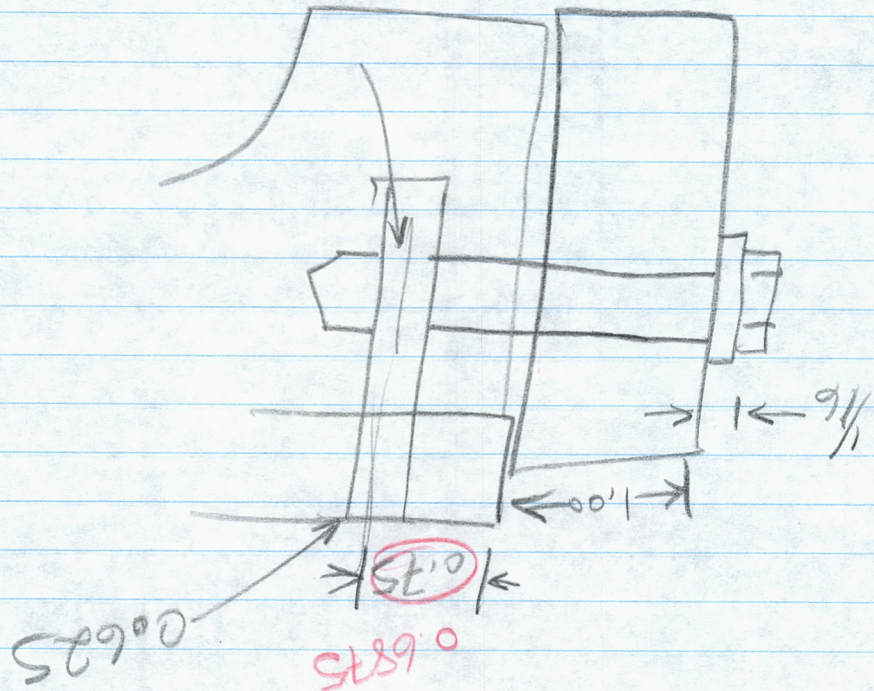
7/16 - 0.049 - 0.068 → ID = 0.314 - 0.340
 7/16 - 0.049 - 0.068 → ID = 0.314 - 0.340

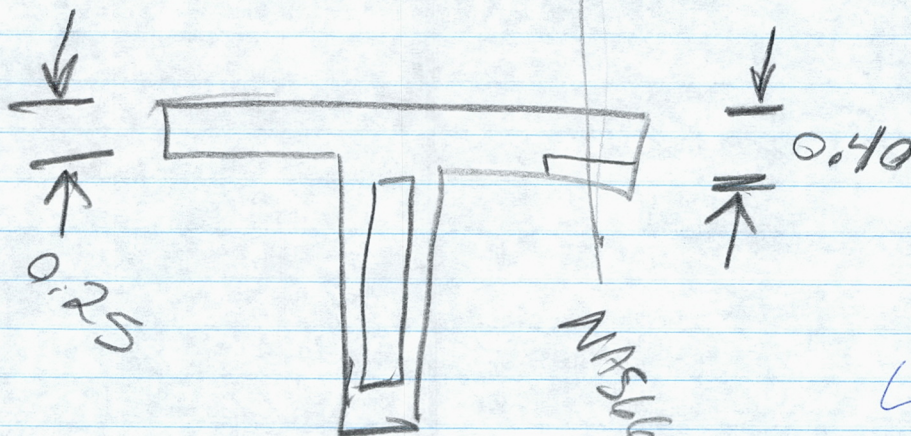
ASA SOUTHERN

GRIP = 1.50 IN → AN6-20

$$L = \frac{1}{16} + 1.00 + 0.75 - 0.3125 + 0.508 + \frac{3}{24} = 2.133 \text{ IN}$$

0.6875
 2.0705
 2 1/32 (2 1/16)
 (2 5/16)





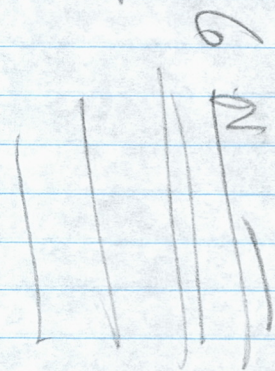
NAS6604-20

SPOTRALE
BETTER

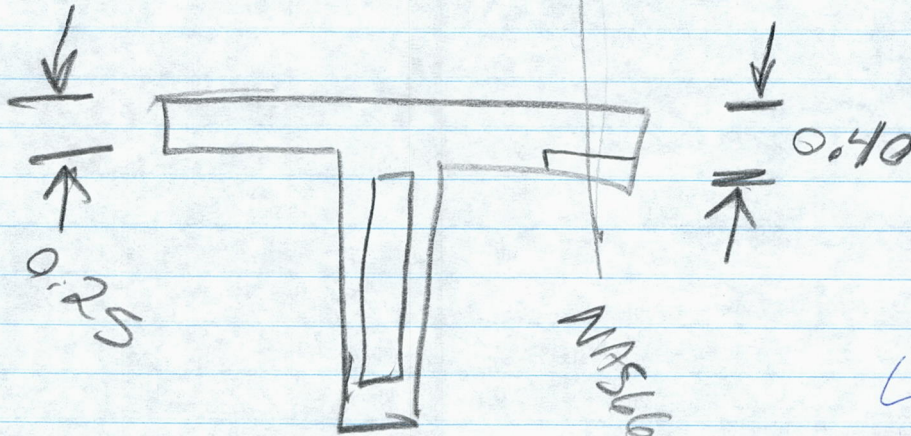
~~JUST GET
NEW BOLTS
THAT ARE LONGER~~



	AFT	END
WAS:	0.300	0.25
IS:	0.50	0.40
DIFF.	0.20	0.15



1304

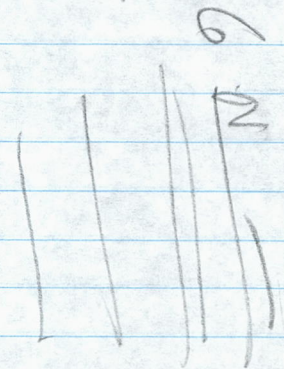


SPOTTRACE
TESTER

~~JUST GET
NEW BOLTS
THAT ARE LONGER~~



	AFT	END
WAS:	0.300	0.25
IS:	0.50	0.40
DIFF.	0.20	0.15



1304

1	SHT. MESH	3/4" x 16 GAUGE	21.20
10'	6061 BAR	@ 10 [¢] /FT	100.00
40'	3/4" TUBE	@ 3.55	142.00
30'	1/2" TUBE	@ 2.21	66.30
6'	HNGE		
3'	1" S.S. TUBE	@ 3.55	10.65

TIME (2 BASKETS) STEVE HRS
 $3 + 7 + 4 + 4 + 4 + 6 + 1 = 29$
JEFF ~~818~~ 16
TED $4 + 4 + 4 + 4 = 16$
 @ 50[¢]/HR x 45
 2250 2250
 1125

 BUILDING JIGS STEVE 16
JEFF 16
 @ 50[¢]/HR 32 = \$1600 800

~~NO 7/16"~~

AIRCRAFT SPRUCE + SOCIETY

HINGE MS20001 P4 6' x 8' LENGTHS

	P/N		
BUSHING STOCK	03-16600	5/16"	LONG
	<u>03-16700</u>	<u>3/8"</u>	<u>8' LONG</u>

NO STOCK
NO SUPPLIER

ON MY MASTERCARD

UPS. / DELIVERY

NOTE B.L. OF FITTING IN 206L-4 MAINT. MAN.!

QUOTES ON FITTINGS + BEAMS.
- USING BARREL NUTS?

ORDER HARDWARE.

REVIEW FITTING REPORT + SEND TO GREG JACK

REPORT ON BASKET STRENGTH + LOAD TEST

~~CUT PIECES FOR MORE BASKETS~~

IN CANADA

206 B ≈ 500

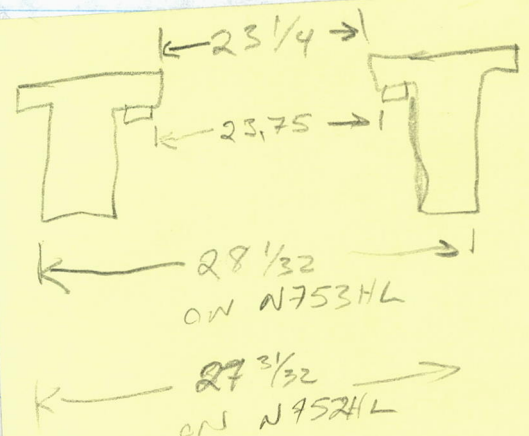
206 L ≈ 70

L-1 ≈ 55

L-3 15

L-4 11

FWD. FTG. $2.437 \begin{matrix} +0.031 \\ -0.009 \end{matrix}$



BACK SPOTFAING TOOL

5/16 DIA HOLE 0.657" FACE

P/N 90-7.9/16.7-CS9.5

COST \$:

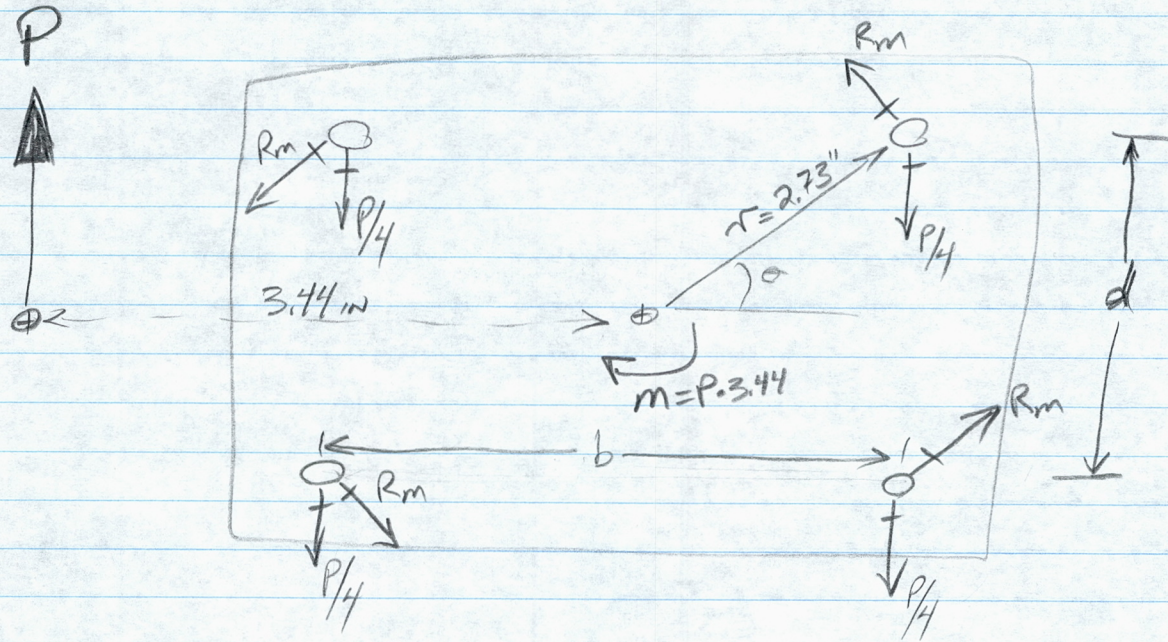
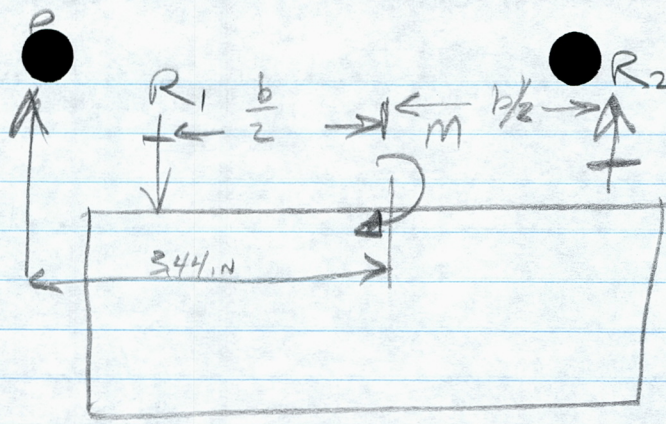
AVAILABILITY :

$$P = 6500 \text{ lb}$$

$$M = 6500 \cdot 3.44$$

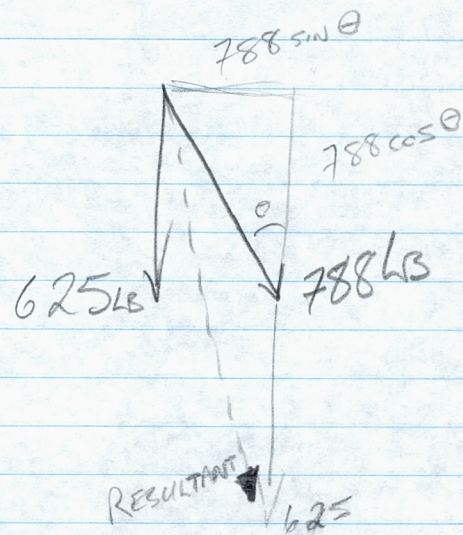
$$M = 22360 \text{ in}\cdot\text{lb}$$

$$R_1 = \frac{m}{\left(\frac{b}{2}\right)} + \frac{P}{2}$$



$$m = (P)(3.44 \text{ in})$$

$$R_m = \frac{m}{4 \cdot 2.73} = \frac{P \cdot 3.44}{4 \cdot 2.73}$$

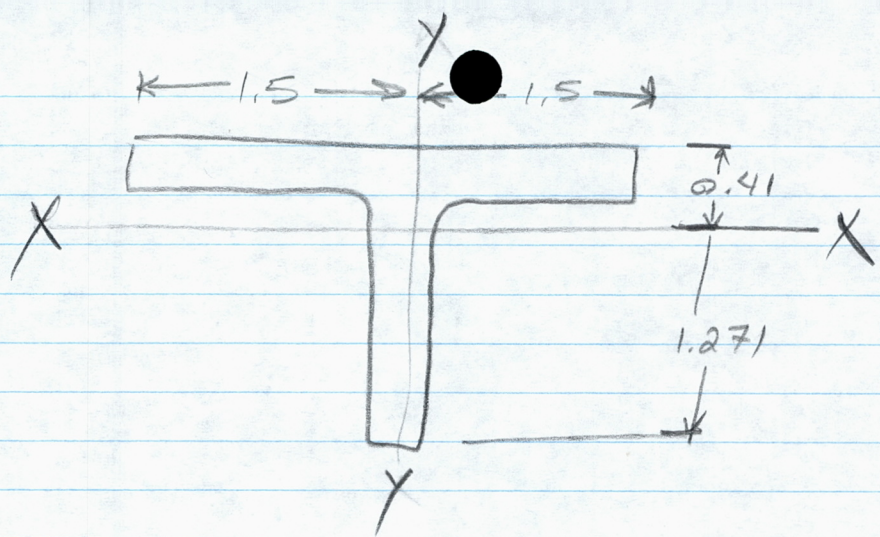


MASS PROPS ●

SECTION X-X

$$I_x = 0.2829$$

$$I_y = 0.9039$$



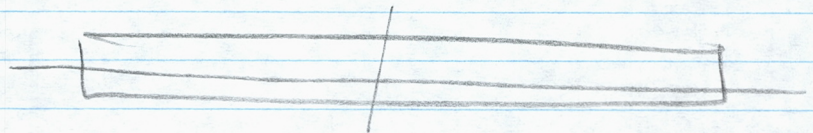
$$z_x = \frac{I_x}{y} = \frac{0.2829}{1.271} = 0.223 \text{ in}^3$$

$$z_y = \frac{I_y}{x} = \frac{0.9039}{1.50} = 0.6026 \text{ in}^3$$

SECTION Y-Y

$$I_x = 0.0313$$

$$I_y = 6.7593$$



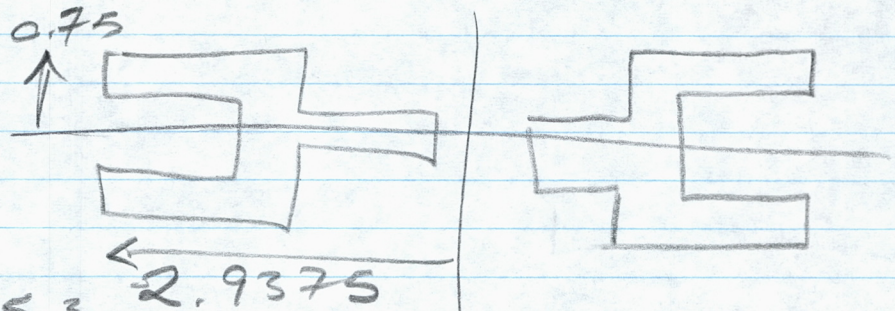
$$z_x = \frac{0.0313}{0.20} = 0.1565 \text{ in}^3$$

$$z_y = 2.301 \text{ in}^3$$

SECTION Z-Z

$$I_x = 0.6037$$

$$I_y = 8.8538$$



$$z_x = \frac{0.6037}{0.75} = 0.805 \text{ in}^3$$

$$z_y = \frac{8.8538}{2.9375} = 3.01 \text{ in}^3$$

FITTING INSTALLATION BOLTS

TOP FLANGE :

FWD	WAS	0.250"	Now	+0.150" 0.400"
OLD BOLT WAS	NAS 6604-5	now	NAS 6604-7	
ADD 0.15"	AN4-6A	now	AN4-7A	
OR 1/8, 2/16, 5/32, 1/4	AN4-7A	now	AN4-10A	
	AN4-17A	now	AN4-20A	
UP ONE DASH #	AN4-20A	now	AN4-21A	
	AN4-30A	now	AN4-31	
AST	WAS	0.300	now	0.500
ADD 0.20"	AN4-7A	now	-11A	
OR 1/4, 2/8, 3/16, 1/32, 13/64	-17A		-21A	
	-20A		-22A	
UP 2 DASH #'S	-30A		-32A	
UP 3 DASH #'S →	NAS 6204-9		-12	
	-25		-28	

BOTTOM FLANGE SAME ON FWD FTG.

UNKNOWN ON AST FTG.

INTEGRIS METAL

38 1/4 x 8

45

~440\$

CROSS-GRAIN

48 1/2 x 40 1/4

~575LB

~2811\$

↳ CUT

8" x 48.5

\$570

8" x 40.25

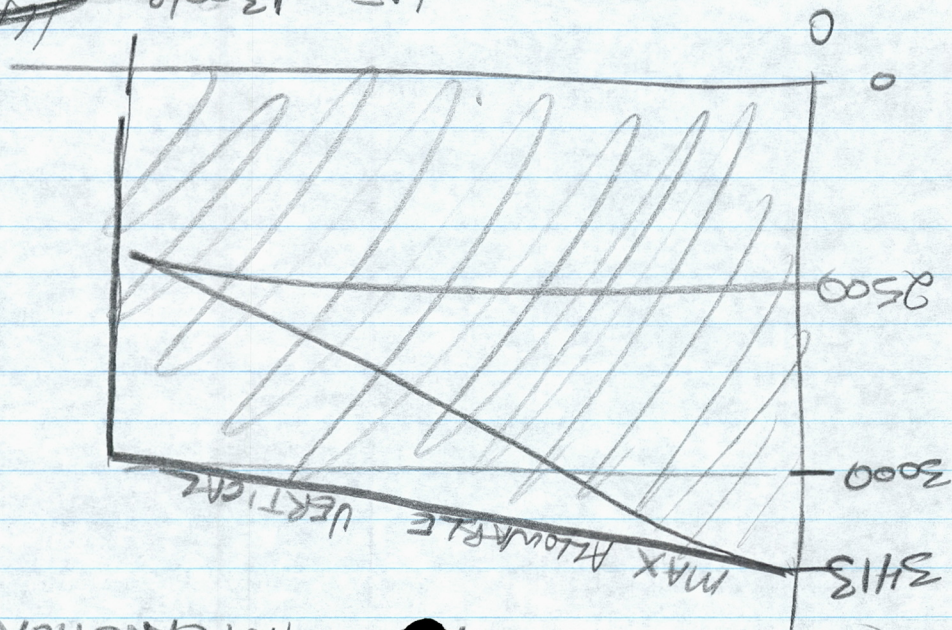
\$480

ALONG

GRAIN

LOAD INTERACTION DIAGRAM

Load



$$3413 - 2500 = 913$$

$$\frac{1300 \times 2 + 2600}{x} = 913$$

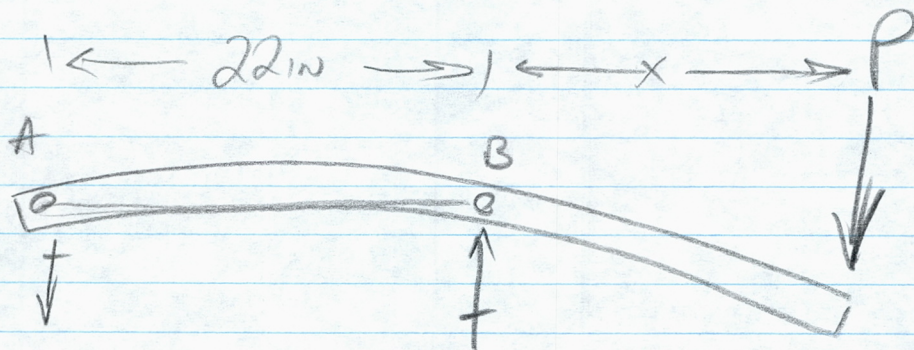
$$P_z = 3413 - 0.1756(P_y + P_x)$$

$$P_x = 900 \text{ LB}$$

$$P_y = 500 \text{ LB}$$

$$P_z = 3413 - 0.1756(2 \cdot 500 + 900)$$

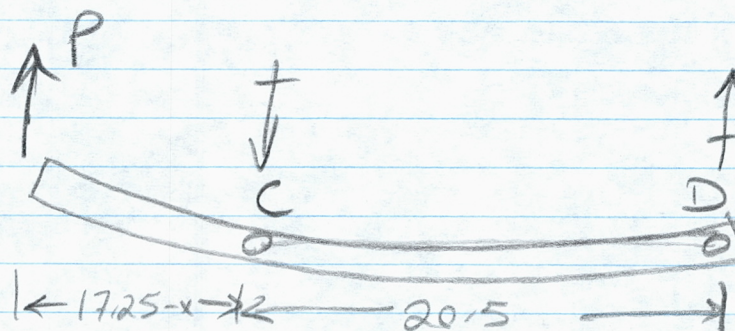
$$= 3079 \text{ LB}$$



$$R_B = \frac{P(22+x)}{22}$$

$$R_A = \frac{Px}{22}$$

$$P = R_B - R_A$$



$$R_C = \frac{P(20.5+17.25-x)}{20.5}$$

$$R_D = \frac{P(17.25-x)}{20.5}$$

$$P = R_C - R_D$$

~~$$R_A + R_B + R_C + R_D = P$$~~

$$R_B - R_A = R_C - R_D$$

$$\frac{22+x}{22} - \frac{x}{22} = \frac{20.5+17.25-x}{20.5} - \frac{17.25-x}{20.5}$$

$$1=1$$

STATICALLY INDETERMINATE

SPS BORREL NUTS

(215)-572-3000
-3718
FAX - 3193

	LOCKING?	DIA	LENGTH	STRENGTH#
H34H 7940 T - 064	✓	0.681	0.75	20.9
H4 LH 7456 T - 064	✓	0.681	0.75	17.0
1452 - 064	✓	0.616	0.938	15.2
2452 - 064	✓	0.646	0.656	17.1
2552 - 064	✓	0.621	0.666	17.1
2752 - 064	✓	0.616	0.75	16.0
42/47/485BM - 624	✓	0.663	0.656	17.1
59764B-624A	✓	0.681	0.75	17.0
95887 - 624 (Ni)	✓	0.684	0.75	20.9
95931 - 624	✓	0.684	0.75	20.9
B12670 - 624	✓	0.684	0.75	13.6
B13759 - 6	✓	0.684	0.75	15.1
LBF577 - 6	✓	0.684	0.75	17.0
LH 2452 - 064	✓	0.663	0.656	17.1
LH 7940 - 064	✓	0.681	0.75	20.9
RMLH2577 - 064	✓	0.684	0.75	17.0

DISTRIBUTORS

LEHIGH ARMSTRONG
ASTRO H/W.
AERO MISSILE COMPONENTS

MASS. (508) 663-0010
N.J. (201) 791-6690
(215) 245-5700

DEAD
ENDS
ALL
NA INVENTORY
DON'T CARRY

LEAVENS

AN 6 - 20A

- 21A

AN 960 - 10L

- 10

- 416L

- 416

- 516L

- 516

AN 4 - 24A

- 25A

MS 21044N3

N4

AN 3 - 15A

- 16A

W + B

BODY	27 LB	113.8	3072.6	38.5	1039.5
LID	11 LB	113.8	1251.8	38.5	423.5
H/W	1 LB	113.8	113.8	(20)	20.0
HANDLE	2 LB	113.8	227.6	51.1	102.2
				17.5	
AFT BEAM	12 LB	151.4	1816.8	16.7	210
FWD BEAM	13 LB	76.4	993.2	16.7	217.1

~~66 LB~~

~~7248.2~~

~~1910.1~~

~~113.3~~

~~29.85~~

66 LB

7475.8

202.3

113.3

30.49

CARGO 200_{max} 113.8

38.5

Alix Machining Inc.
#111 4712 13th Street N.E.
Calgary, Alberta
T2E 6P1
403-291-5313
fax: 291-7056

QUOTATION

Date: 14 MAY / 02

For: AERO DESIGN LTD Attention: TED / STEVE

Fax #: 250-8333 Phone #: 250-8027

Job Description: MACHINE BELL 206L SERIES
EXTERNAL ATTACHMENT PROVISIONS
FITTINGS HOG-OUT

Material to be used: 6061 T6

Material supplied by: Your Company ☒ Alix Machining Inc. ☐

Total Cost: _____ Estimated delivery time: 1-2 wks after order.

Comments: HI TED / STEVE

1 AFT HOG-OUT \$ 900.00

1 FORWARD HOG-OUT \$ 900.00

THANKS

STEVE

Please don't hesitate to call with any Questions/ Comments.

All quotes valid for 30 days.
Prices do not include G.S.T.

Fax

MCO Industries Inc.

2915 15 St. NE

Calgary, Alberta,
Canada.

T2E 7L8

phone 403-250-5322 fax 403-250-5364

www.stratex-mco.com

Email medlowa@stratex-mco.com

Date : May 14, 2002
Pages : 1
To : Ted Burgoin
Company : Aero Design Ltd.
Fax Number : 250-8333
From : Alan Medlow
Subject : quote

Dear Ted,

Here is our quote to manufacture the following parts.

Part Desc.	Part #	Qty	Cost ea.
Bell 206L aft fitting	49360-02	1	\$525.00
Bell 206L forward fitting	49360-01	1	\$595.00

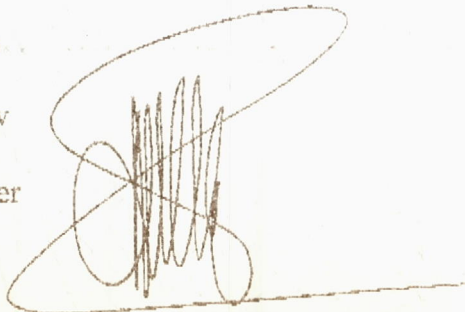
Delivery 1 week

Please note all new customers are subject to a COD basis until a successful credit references can be established.

Best Regards

Alan Medlow

Sales Manager



Laser Equation Inc.
"Industrial Cutting Solutions"#10, 1236 - 38th Avenue N.E.
Calgary, AB. T2E 6N2

Tel: (403) 250-2603

Fax: (403) 735-5123

FAX TRANSMITTAL

To: Steven

P.O. No: N.A.

Number of Pages: 1

QUOTATION

Quotation No.: 19189

Customer No.: 121

Date: May. 10, 02

CUSTOMER:**Aero Design Ltd.**

1045 McTavish Road, N.E.

Calgary, AB

T2E 7G9

Phone: (403) 250-8027

Cell:

Fax: (403) 250-8333

PART DESCRIPTION AND PRICE:

Item No.	Part description	Unit Price	No. of Units	Total Price
1	Plates #49221-02 AFT Mounting beam	\$60.37	3	\$181.11
2	Plates #49221-01 Forward Mounting beam	\$61.87	3	<u>\$185.61</u>
Total				\$366.72

Received and approved by: _____

Please initial and return with purchase order to authorize job to proceed.

SCOPE:**DESIGN:**Design, drawing and computer file (DXF or otherwise)
supplied by **Aero Design Ltd.**

Creation of the computer drawing/file.

Included

PROGRAMMING:

Laser or Water Jet machine programming.

Included

PREPRODUCTION:

Production set up.

Included

MATERIAL:

16 GA. S/S 304 2B.

Supplied by **Aero Design Ltd.**

Included

PROCESSING:Laser cutting (Tolerance $\pm .005$)

Included

G.S.T.

Extra

Not included

DELIVERY:

Quotation based on customer pickup of parts at LEI's Shop.

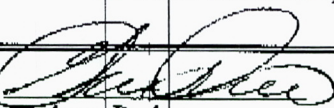
Not included

TERMS AND CONDITIONS:**COMPLETION:**Four (4) days after receipt of order, detailed drawing, computer file (DXF or otherwise) or material, whichever occurs last. (**Delivery dates are only approximate.**)**GENERAL:**

Standard terms and conditions apply.

To check on status of your order please call Lori Lee @ (403) 250-2576

Submitted by


Graham Park

Laser Equation Inc.
"Industrial Cutting Solutions"

#10, 1236 - 38th Avenue N.E.
Calgary, AB. T2E 6N2

Tel: (403) 250-2603
Fax: (403) 735-5123

FAX TRANSMITTAL

To: Steven
P.O. No: N.A.

Number of Pages: 1

QUOTATION

Quotation No.: 19189

Customer No.: 121

Date: May. 10, 02

CUSTOMER:

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, AB

T2E 7G9

Phone: (403) 250-8027
Cell:
Fax: (403) 250-8333

PART DESCRIPTION AND PRICE:

Item No.	Part description	Unit Price	No. of Units	Total Price
1	Plates #49221-02 AFT Mounting beam	\$107.04	1	\$107.04
2	Plates #49221-01 Forward Mounting beam	\$108.54	1	\$108.54
		Total		\$215.58

Received and approved by: _____

Please initial and return with purchase order to authorize job to proceed.

SCOPE:**DESIGN:**

Design, drawing and computer file (DXF or otherwise)
supplied by **Aero Design Ltd.**

Creation of the computer drawing/file.

Included

PROGRAMMING:

Laser or Water Jet machine programming.

Included

PREPRODUCTION:

Production set up.

Included

MATERIAL:

1.0 Flat Bar.

Supplied by **Aero Design Ltd**

Included

PROCESSING:

Water Jet cutting (Tolerance up to 1" \pm .010 & 1" & over \pm
.020) or as stated by LEI.

Included

G.S.T.

Extra

Not included

DELIVERY:

Quotation based on customer pickup of parts at LEI's Shop.

Not included

TERMS AND CONDITIONS:**COMPLETION:**

Four (4) days after receipt of order, detailed drawing, computer file (DXF or otherwise) or material, whichever occurs last. **(Delivery dates are only approximate.)**

GENERAL:

Standard terms and conditions apply.

To check on status of your order please call Lori Lee @ (403) 250-2576

Submitted by: _____

Graham Park

AERO DESIGN LTD.

1045 McTavish Rd. N.E.

Calgary, Alberta

T2E 7G9

13 May, 2001

Transport Canada
Aircraft Certification Division
Edmonton Aircraft Certification Office
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Mr. Jack Staal

Re: Installation of Cargo Basket on Bell 206L

Out file: 492
Your file: n/a

Jack:

Since Greg handed this off to you, I am sending the following documents straight to you:

Engineering Report
Engineering Report

ER 492.01	Rev. 0
ER 492.02	Rev. 0

Please phone to discuss this project, and the related provisions, so that we may know when you will be signing off on the items in the compliance program in your jurisdiction, and issuing the STC's.

Regards,



S. Fahey, Technologist

Encl.

AERO Design Ltd.

TEST REPORT ER492.02

Side-Mounted Cargo Basket

Bell 206 L Series

Basket Load Tests

Approved: E. Burgoin, P. Eng.

Prepared: S. Fahey

Date: 09 May, 2002
Revision 0

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
Telephone: (403) 250-8027; Facsimile: (403) 250-8333
E-Mail: aerodsgn@telusplanet.net

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1.0 INTRODUCTION

Operators of the 206L helicopter find that it is an advantage to have more cargo area in their helicopters. This cargo basket is an improved solution to the problem of cargo space than cargo baskets in the past: it carries more weight, and is less obtrusive than other cargo baskets. By employing the Aero Design Ltd. External Attachment Provisions, it is much simpler and quicker to install and remove than competing baskets.

This report documents the strength of the basket structure.

2.0 REFERENCE

Aero Design Ltd. Drawings 49201 through 49220.

Mil-Hdbk-5H

Aero Design Ltd. Test Report TR362.02, Revision 2

3.0 BASIS OF CERTIFICATION

To be applicable to all models of the 206L series, the certification basis of the 206L-4 is used:

Bell 206L-4	Canadian Type Approval	H-92
	FAA Type Certificate	H2SW

FAR Part 27 dated 2 October 1964 Amendment 27-1 through 27-24 with:

27.79, 27.143, 27.173, 27.175, 27.1519, 27.1585, 27.1587 at Amdt 27-1;

27.1093, 27.1545 at Amdt 27-8;

27.45, 27.141, 27.1309 at Amdt 27-20;

27.2, 27.307, 27.337, 27.351, 27.427, 27.501, 27.571, 27.613, 27.629, 27.663, 27.674, 27.685, 27.727, 27.783, 27.807, 27.861, 27.865 at Amdt 27-28;

and 27.391, 27.395, 27.397, 27.681, 27.1357, 27.1361, replaced by 6.220, 6.225, 6.323, 6.623, 6.624, 6.625, 6.626 of CAR Part 6 dated 6 December 1956 Amendment 6-1 through 6-4.

Exceptions to FAR 27 are the deletion of: 27.71, 27.177, 27.399, 27.562, 27.610, 27.954, 27.1195, 27.1322.

Equivalent Safety Findings:

1. Skid Landing Gear (Drop Test) FAR 27.723, 27.725, and 27.727
2. Fuel Tanks (Drop Test)- FAR 27.965(c)(1) and (c)(2). FAR Part 36 dated 3 November 1969 Amendment 36-1 through 36-14, Subpart H.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

Airworthiness Directives applicable to the Bell 206L series have been reviewed and no conflicting AD's were found. See Appendix A.

AD's CF-95-17 and CF-98-43 refer to cracking of the landing gear cross-tubes, found particularly around riveted connections at the saddles, and at the fuselage mounting points. The basket is not mounted to the cross tubes.

The basket installation is unaffected by these AD's.

5.0 LOADS

5.1 Inertia Load Factors

BELL 206L4 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

Ultimate Upward Emergency Landing Load Factor: $n_{e_up} := 1.5$

Ultimate Forward Emergency Landing Load Factor: $n_{e_fwd} := 4.0$

Ultimate Sideward Emergency Landing Load Factor: $n_{e_side} := 2.0$

Ultimate Downward Emergency Landing Load Factor: $n_{e_down} := 4.0$

FAR 27.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

FAR 27.303 Safety Factor: $n_{sf} := 1.5$

FAR 27.337(a) Limit Positive Manouvering LoadFactor: $n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$ Ultimate Positive Manouvering LoadFactor: $n_{man_ult} = 5.25$

Limit Negative Manouvering LoadFactor: $n_{man_n} := -1.0$

$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$ Ultimate Negative Manouvering LoadFactor: $n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Manoeuvring Load Factor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.2 Inertia Loads**TEST LOADS ON BASKET**

Weight of basket.	$W_{basket} := 55 \text{ lbf}$
Cargo Capacity of basket.	$W_{cargo} := 200 \text{ lbf}$
Fitting Factor (Not required where compliance is shown by test)	$n_{ff} := 1.15$

DOWNWARD:

The basket shall support its contents under the maximum manoeuvring load factor.

	Ultimate Positive Manoeuvring Load Factor:	$n_{man_ult} = 5.25$
$P_{z_ult} := (W_{basket} + W_{cargo}) \cdot n_{man_ult}$	Ultimate Vertical Load on basket.	$P_{z_ult} = 1339 \text{ lbf}$

FORWARD:

Deflection of the basket, or shifting of its contents in the forward direction in an emergency landing does not endanger the occupants of the helicopter.

Ultimate Forward Emergency Landing Load Factor: N/A

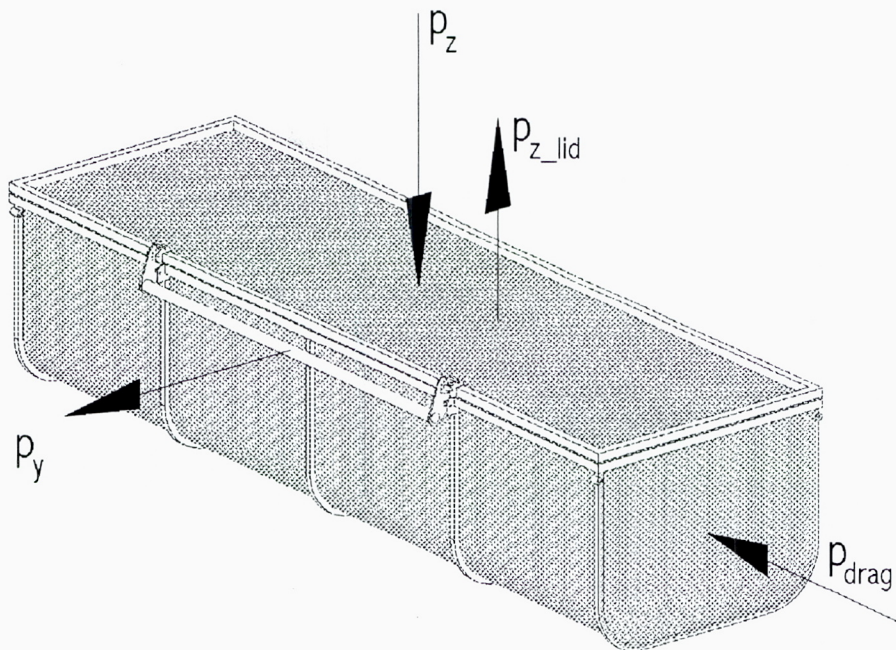


Figure 5.1 Loads on Basket

SIDEWARD:

Deflection of the basket, or shifting of its contents in the sideward direction in an emergency landing does not endanger the occupants of the helicopter. However, to ensure that the lid of the basket cannot open during flight, the ultimate sideward load factor will be used. The handle latches the lid closed, and is retained by a torsion spring.

Ultimate Sideward Emergency Load Factor: $n_{e_side} = 2.00$

The handle must stay closed when pulled sideways with twice its weight

UPWARD:

For attachment of the basket to the helicopter, the critical vertical load is downward, but this load factor will be used to ensure that the lid cannot open during flight or an emergency landing.

Ultimate Upward Emergency Load Factor: $n_{e_up} = 1.50$

$$p_{z_lid} := W_{cargo} \cdot n_{e_up}$$

Ultimate Upward Load of cargo on lid. $p_{z_lid} = 300 \cdot \text{lbf}$

5.3 Drag Loads

	Length of basket.	$l_{\text{basket}} := 74 \text{ in}$
	Width of basket.	$w_{\text{basket}} := 22 \text{ in}$
	Height of basket.	$h_{\text{basket}} := 16 \text{ in}$
$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$	Frontal Area of basket.	$A_f = 2.44 \text{ ft}^2$
$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$	Planar Area of basket.	$A_p = 11.31 \text{ ft}^2$
	Fineness ratio of basket	$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$
	Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Figure 22).	$C_{Do} := 1.6$
	Density of air at Sea Level.	$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$
	Never-Exceed-Speed of 206L-4. (Ref. 206L-4 Flight Manual.)	$V_{ne} := 126.5 \text{ knots}$
$V_d := \frac{V_{ne}}{0.9}$	Dive Speed of Bell 206L-4	$V_d = 141 \text{ knots}$
$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$	Drag on basket.	$\text{Drag} = 262 \text{ lbf}$
$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$	Ultimate applied Drag load on basket.	$P_{\text{drag_ult}} = 451 \text{ lbf}$
$P_{\text{drag_test}} := \text{Drag} \cdot n_{sf}$	Ultimate Drag load on basket in Static Test.	$P_{\text{drag_test}} = 393 \text{ lbf}$

6.0 STRUCTURAL TESTS

6.1 Downward Load and Drag Load Combined Test

The basket was tested to demonstrate it can support both the ultimate Manouvering Load applied by its cargo, and the ultimate Drag Load applied by the air at V_d . The basket was suspended between two tables as shown in Figure 6.1. The basket was bolted to angle-irons on the edges of each table to simulate its attachment to the beams. Strips of plywood were lain down on the bottom of the basket to distribute load evenly.

Ultimate Vertical Load on basket.

$$P_{z_ult} = 1339 \cdot \text{lbf}$$

Ultimate Drag load on basket in Static Test.

$$P_{\text{drag_test}} = 393 \cdot \text{lbf}$$



Figure 6.1 Basket Set-Up Between Tables

To apply the ultimate Drag Load, a chain – load-cell – come-along system was set up beneath one of the support tables, as shown in Figure 6.2. The chain was hooked to a Brownline fitting, mounted in a strip of Brownline track clamped to the bottom of the basket, which is visible in Figure 6.3. Note that applying the drag load to the bottom of the basket, and not to the center of its face, is conservative.

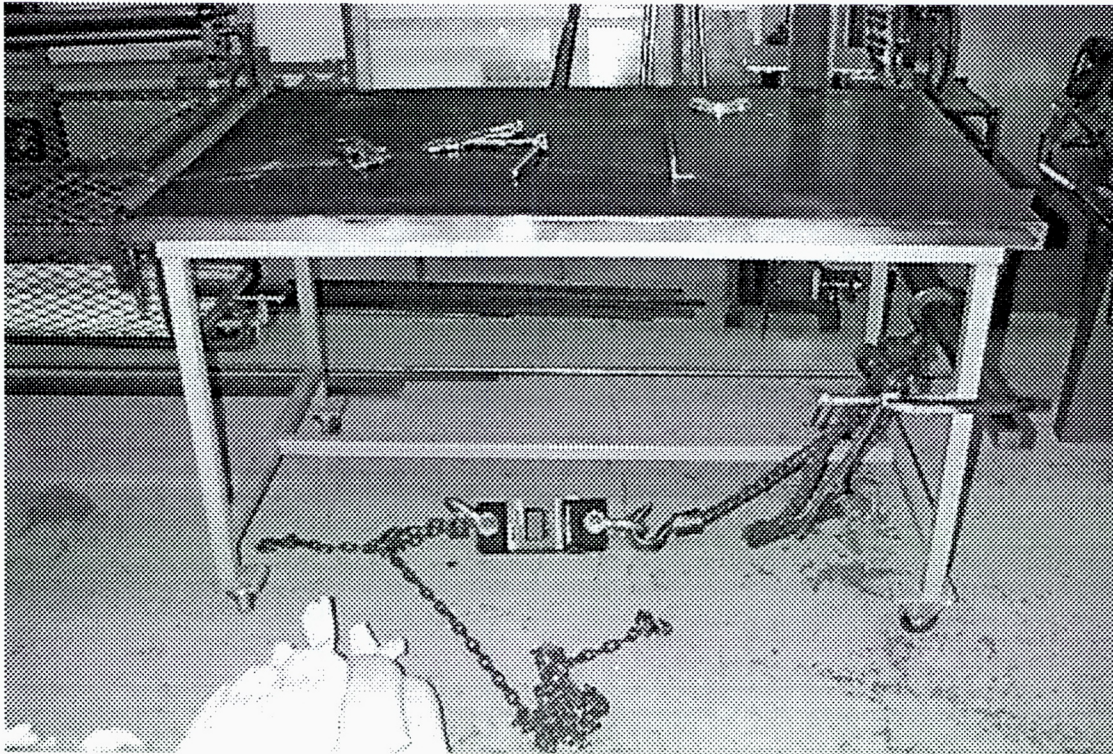


Figure 6.2 Drag Load Test Set-Up

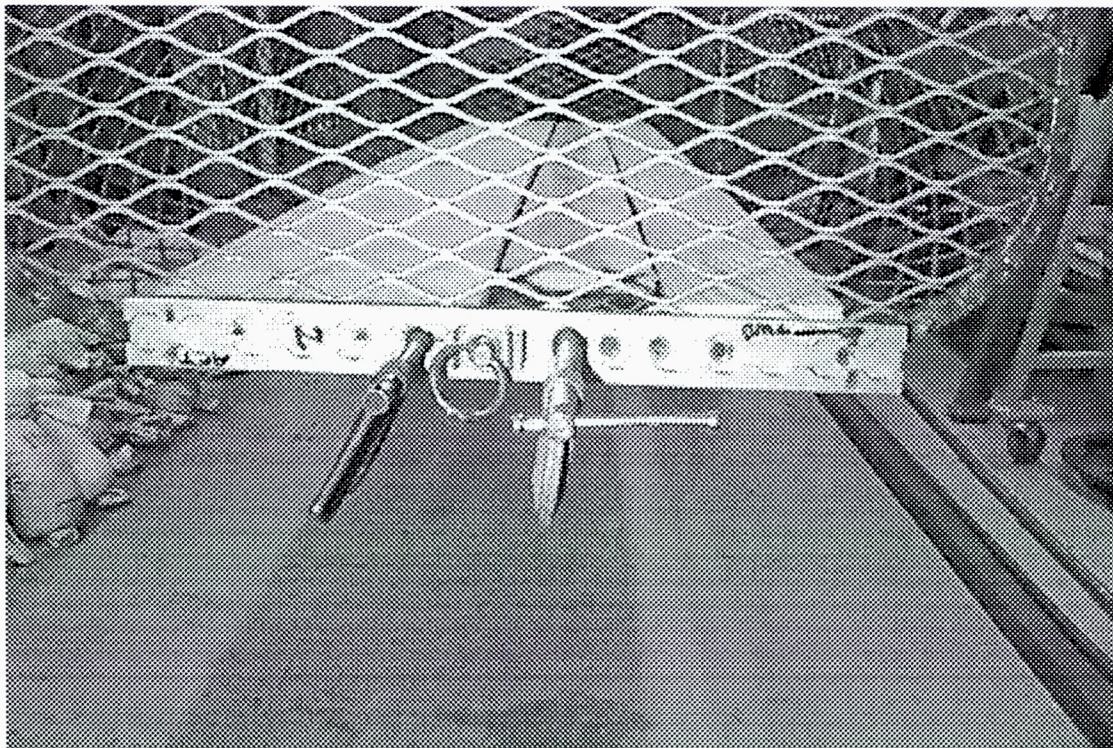


Figure 6.3 Drag Load Test Attachment for Chain

To apply the ultimate Manouvering Load, 68 bags of lead shot (25 pounds each) were stacked in the basket as shown in Figure 6.4.



Figure 6.4 68 Bags of Lead Shot Stacked in Basket

By putting 68 bags of lead shot in the basket, 1700 pounds of vertical load were applied to the basket.

The come-along was tightened until the load cell read 530 pounds of tension in the chain, as shown in Figure 6.5.

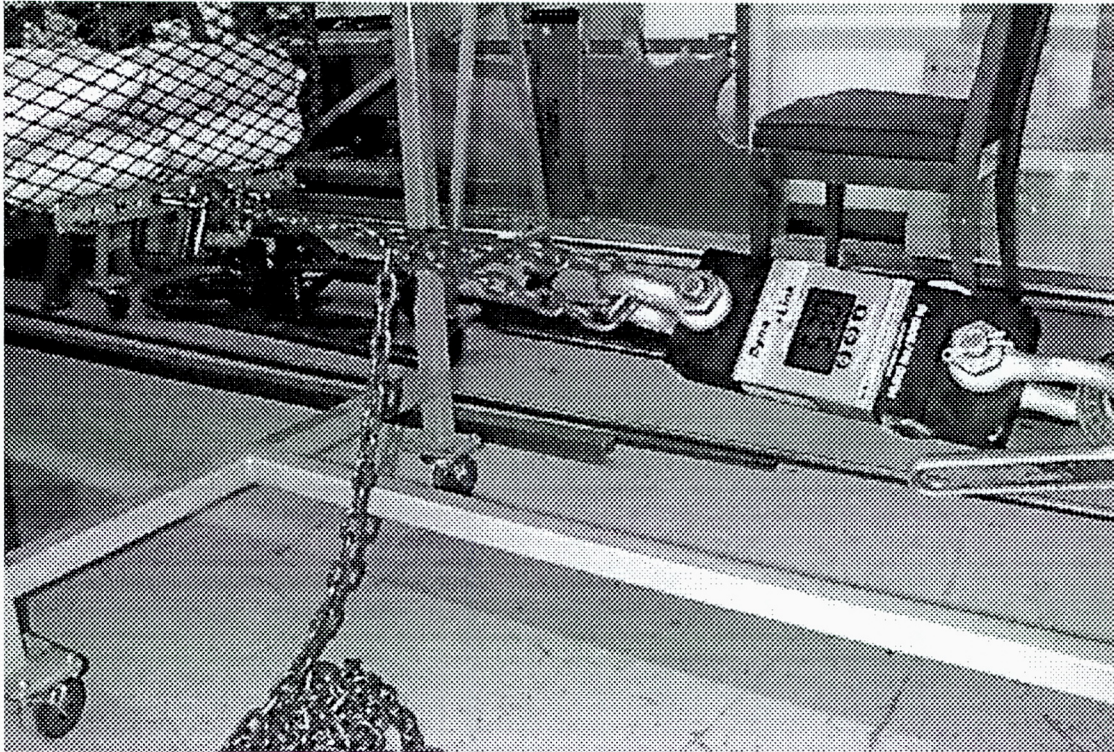


Figure 6.5 Pulling 530 Lb Drag Load

With the loads on the basket, the deflection of the basket was very small. The bottom sank only about 1/2"

When the loads were released, the basket showed no sign of failure or permanent deformation.

Margin of Safety = Positive

6.2 Sideward Load Test on Handle

The basket uses the same handle assembly to close its lid as the 407 basket.

Reference test performed in TR362.02, Section 7.4.

Margin of Safety = Positive

6.3 Upward Load Test on Lid

Reference test performed in TR362.02, Section 7.3.

Margin of Safety = Positive

APPENDIX A

AIRWORTHINESS DIRECTIVES APPLICABLE TO THE BELL 206L SERIES

AIRWORTHINESS DIRECTIVES

Applicable to Canadian registered or manufactured aeronautical products

Database Last Updated: 2002-03-16

Directives Pertaining to Model: **BELL, 206L**

40 ADs found

Country:	AD Number:	AD Subject:	SB Reference:
CF	<u>CF-2001-33</u>	CHIP DETECTOR ASSEMBLY	206-01-96 REV A
CF	<u>CF-2001-13</u>	SOLOY ENGINE RPM SENSOR	SOLOY 02-680R2
CF	<u>CF-2000-13</u>	COLLECTIVE LEVER - RAISED FORGING BOSS	ASB 206-00-93
CF	<u>CF-98-43</u>	CROSSTUBE ASSEMBLIES	
CF	<u>CF-98-27</u>	TAILBOOM MODIFICATION	ASB 206L-87-47 REV C
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21
CF	<u>CF-1998-42R4</u>	CRACKED TAIL BOOM SKIN	206L-99-115 REV E
CF	<u>CF-97-03</u>	MAST AND TRUNNION RETIREMENT LIFE	
CF	<u>CF-96-11</u>	FUEL CELL VENT TUBE - WATER INGESTION	206-95-156
CF	<u>CF-95-19</u>	TEMP-PLATES OVERHEAT INDICATORS	ASB 206L-93-91 REV B
CF	<u>CF-95-17</u>	CROSSTUBE FAILURES	AA-ASB 94045/94046
CF	<u>CF-95-11R2</u>	UNAPPROVED BOLTS, FLIGHT CONTROL SERVO ACTUATORS	206-67-02, 206-67A-01
US	<u>95-09-06</u>	INADVERTANT FUEL VALVE SWITCH POSITIONING	206-90-54/206L-90-67
US	<u>94-24-11</u>	TAIL ROTOR DRIVESHAFT MISALIGNMENT	206-92-69/206L-92-84
US	<u>94-20-03</u>	MAIN ROTOR HUB TRUNNION	206L-93-90
US	<u>94-19-02</u>	SWASHPLATE SUPPORT ASSEMBLY	206-93-74 REV B
US	<u>94-15-07</u>	MAIN ROTOR BLADES CRACKS	ASB 206-93-77
US	<u>92-06-12</u>	MAIN TRANSMISSION SUNGEAR	206-90-56, 206L-90-69
US	<u>92-01-05</u>	MAIN ROTOR BLADES (FALSIFIED COMPONENT RECORDS)	
US	<u>91-23-15</u>	ENGINE RPM SENSOR	SOLOY 02-680
US	<u>91-03-12</u>	EMERGENCY FLOAT BAGS	206L-89-63, 206-89-49
US	<u>90-21-03</u>	TAIL ROTOR BLADE TIP WEIGHT	
US	<u>90-13-01R1</u>	TAIL ROTOR BLADES	
US	<u>89-22-01R1</u>	MAIN ROTOR BLADES	
US	<u>89-20-13</u>	HORIZONTAL STABILIZER	
US	<u>88-26-03</u>	FUEL SYSTEM FLOW SWITCHES	206L-88-52
US	<u>88-23-03</u>	TAIL ROTOR YOKE ASSEMBLY	
US	<u>87-10-11</u>	MAIN ROTOR MAST	206-87-37, -44
US	<u>86-24-01</u>	TAIL ROTOR YOKE	
US	<u>85-26-06</u>	TAIL ROTOR BLADES	
US	<u>85-25-01</u>	CYCLIC CONTROL STICK	206-85-29, 206L-85-36
US	<u>85-09-04</u>	MAIN ROTOR BLADES	ASB 206L-85-35
US	<u>83-03-04</u>	CHECK OF SHEAR HEADS-FLOAT INFLATION VALVES	SB 206L-81-21
US	<u>82-16-12</u>	WITH CHADWICK C-22 AFS PER STC SH139W	CHADWICK SB 20-81-01
US	<u>82-05-03</u>	HORIZONTAL STABILIZER ASSEMBLY	ASB 206L-81-23 REV A
US	<u>80-18-04R1</u>	MAIN ROTOR TRUNNION	ASB 206L-80-9 REV A
US	<u>80-17-05</u>	TAIL ROTOR BLADES	
US	<u>78-24-06R1</u>	HORIZONTAL STABILIZER	
US	<u>78-11-02R1</u>	M/R BLADE STRAPS	
US	<u>76-14-05</u>	FUEL SYSTEM COMPONENTS	

CF-95-17 BELL

Applies to all models of Bell 206 series helicopters equipped with the following crosstube assemblies (crosstubes):

- (i) Aeronautical Accessories Inc. P/N 206-320-101 and -102
206-321-001 and -002
206-323-*
206-325-*
206-328-*
206-329-001 and -002
- (ii) Airborne Supply Inc. P/N AB206-050-107 and -119*
AB206-053-109*
- (iii) Bell Helicopter Textron P/N 206-050-107, -119, -134, -157 and 169*
206-053-109, -119 and -129*

(iv) Other manufacturers, as approved by the P/N Any of the above
Federal Aviation Administration (FAA)
under Parts Manufacturer Approval (PMA)

*All dash numbers

Compliance is required as indicated.

Two accidents have been attributed to crosstube failures. There has also been a number of reports of cracks due to corrosion or metal fatigue that might cause a failure of the crosstubes. On the crosstubes of older design, the cracks were mostly found at the rivet holes in the attachment-to-fuselage area and at the saddle attachment. On the newer, clamp-on tubes without holes, the cracks were mostly found in the saddle attachment area and along the line where the clamp touches the tube. Helicopters operating in a corrosive environment, or being used in a training or sightseeing role involving frequent landings are most affected.

To prevent failure of the affected crosstubes accomplish either Part I or Part II below, depending on the type of crosstube:

Part I For Aeronautical Accessories Inc. Crosstubes

A. For Model 206A and 206B Helicopters:

1. Initially, within the next 100 hours time-in-service, unless already accomplished, perform an inspection as per Aeronautical Accessories Inc. Alert Service Bulletin (ASB) No. 94045, Revision B dated 17 April 1995.
2. Not later than 1 February 1996, incorporate into the operator's aircraft inspection program the procedures of Report No. AA-94022, Revision G or later revision, as referenced in ASB No. 94045, Revision B. The required procedures shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

B. For Model 206L, 206L-1, -3 and -4 Helicopters:

1. Initially, within the next 100 hours time-in-service, unless already accomplished, perform an inspection as per Aeronautical Accessories Inc. ASB No. 94046, Revision B dated 17 April 1995.
2. Not later than 1 February 1996, incorporate into the operator's aircraft inspection program the procedures of Report No. AA-94023, Revision D or later revision, as referenced in ASB No. 94046, Revision B. The required procedures shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

Part II For All Other Affected Crosstubes

1. Initially, within the next 100 hours time in service, perform a detailed visual inspection of the crosstubes for cracks and corrosion, using a 10-power magnifying glass. Pay particular attention in the strap and the saddle attachment area for mechanical damage and corrosion which could lead to cracks. If there is any indication of cracks or corrosion, remove the paint in suspected areas and perform the detailed visual inspection. If the crosstube has rivet holes in the attachment-to-fuselage area, visually check using a 10-power magnifying glass for cracks emanating from the rivets holes. Refer to the applicable Maintenance Manual for inspection limits. In the absence of manufacturer's limits, the maximum allowable depth of corrosion is limited to 0.005 inch over an area not exceeding one-fourth the circumference by 3 inches in length after cleanup, regardless of location. If any crosstube is found corroded beyond the maximum allowable limit, or cracked, replace the part with a serviceable one before further flight.

2. Not later than 1 February 1996, incorporate the requirements of paragraph 1 above in the operator's aircraft inspection program. The required inspection shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

Note: The amendments to the aircraft inspection program, required by Parts I and II above, eliminate the requirement to record in the aircraft records the intervals of this directive and the repeat certification of accomplishment in accordance with Airworthiness Manual Chapter 575.

This inspection task insertion is to include the following:

"AD CF-95-17 refers. This task is not to be escalated or removed from the inspection program without approval by Transport Canada, Chief Continuing Airworthiness, Ottawa."

Replacement of affected crosstubes with later part number crosstubes constitutes terminating action for the inspection requirements of this directive.

Alternative means of compliance with the requirements of this directive may be used only if approved by the Director, Airworthiness Branch, Transport Canada, Ottawa. Any application should be made to the appropriate regional office.

This airworthiness directive (AD) supersedes Federal Aviation Administration (FAA) AD 95-11-14. It also supersedes Transport Canada Alleviation No. AARDG 95/A90, issued to operators of Canadian registered Bell 206 helicopters on 16 June 1995.

This directive becomes effective 9 January 1996.

CF-98-43 BELL

Applies to all Bell Helicopter Textron Canada (BHTC) Model 206 series helicopters equipped with crosstube assemblies (crosstubes) of older design having rivet holes in the support area designated for rivet-on supports with the following, but not limited to, part numbers:

- (i) Aeronautical Accessories Inc. 206-321-001 and -002
- (ii) Airborne Supply Inc. AB206-050-107-025 and -027
 AB206-050-119-005 and -007
- (iii) Bell Helicopter 206-050-107-011, -013, -025 and -027
 206-050-119-001, -003, -005 and -007
 206-050-134-001, -003, -005, -007, -009 and -011
 206-050-169-001, -003, -011 and -013
 206-053-109-001, -003, -005 and -007
 206-053-119-001 and -003
 206-053-129-009, -011, -101 and -103
- (iv) Other manufacturers, as approved by Any of the above the Federal Aviation
Administration (FAA) under Parts Manufacturer Approval (PMA)

Note: The riveted crosstubes of newer configurations, P/N 206-050-2xx-xxx and 206-053-2xx-xxx, having rivet holes only on the sides of the crosstube, are not affected by this directive.

Compliance is required as indicated, unless already accomplished.

The older versions of riveted crosstubes were subject to fatigue cracking; the large majority of cracks started at the top rivet holes under the support assemblies. A few started elsewhere at corrosion or mechanically damaged initiation points. Two accidents have been attributed to crosstubes breaking from cracks starting at the rivet holes. Since the issue of Airworthiness Directive CF-95-17, which introduced inspections, a total failure of an aft crosstube occurred just 40 hours air time after it was properly inspected. The crack had gone undetected under the strap assembly until progressing rapidly once near the strap's edge. Therefore, these older riveted configurations need to be retired within a reasonable time in service.

To prevent a possible catastrophic failure of the crosstube assemblies accomplish the following:

1. Within the next 100 hours air time after the effective date of this directive, remove from the helicopter any crosstube of unknown history or having a total of six or more years in service.
2. No later than 31 December 2000, remove any of the affected crosstubes, regardless of time in service.

This directive becomes effective 15 February 1999.

APPENDIX B

DRAG COEFFICIENTS FOR BLUNT-ENDED RECTANGULAR BODIES

HOERNER, FLUID DYNAMIC DRAG, PAGE 3-12, FIGURE 22

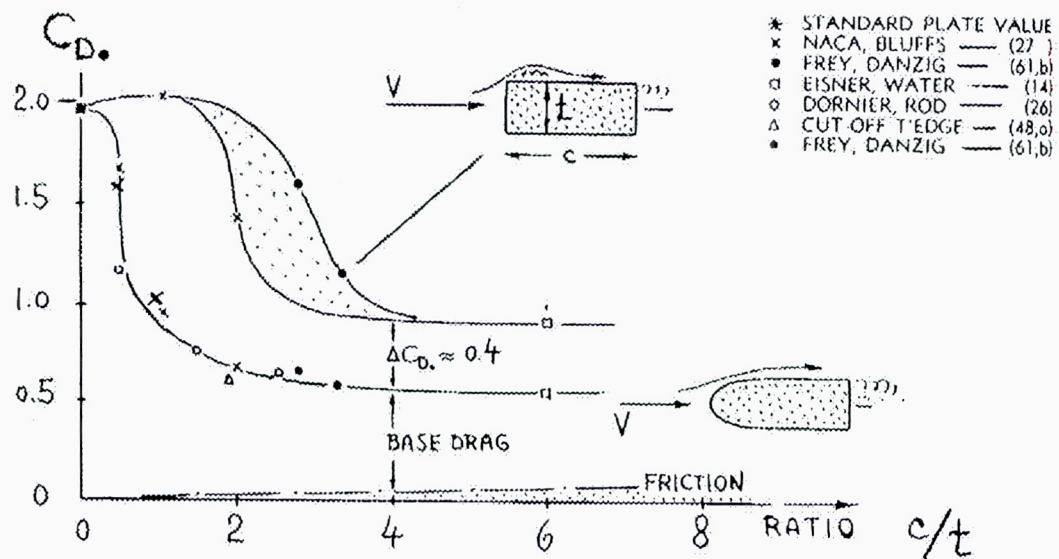


Figure 22. Drag coefficient of "rectangular" sections (tested between walls) with blunt leading edge (upper part) and with rounded shape (lower part), against length ratio.

AERO Design Ltd.

ENGINEERING REPORT ER492.01

Side-Mounted Cargo Basket

Bell 206 L Series

Attachment of Basket Installation to Fuselage

Approved: E. Burgoin, P. Eng.

Prepared: S. Fahey

Date: 09 May, 2002

Revision **DRAFT**



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1.0 INTRODUCTION

Operators of the 206L helicopter find that it is an advantage to have more cargo area in their helicopters. This cargo basket is an improved solution to the problem of cargo space than cargo baskets in the past: it carries more weight, and is less obtrusive than other cargo baskets. By employing the Aero Design Ltd. External Attachment Provisions, it is much simpler and quicker to install and remove than competing baskets.

This report documents the strength of the basket installation's attachment to the External Attachment Provisions on the fuselage.

2.0 REFERENCE

Aero Design Ltd. Drawings 49201 through 49220.

Mil-Hdbk-5H

Aero Design Ltd. Engineering Report ER492.02

Aero Design Ltd. Engineering Report ER493.01

3.0 BASIS OF CERTIFICATION

To be applicable to all models of the 206L series, the certification basis of the 206L-4 is used:

Bell 206L-4

Canadian Type Approval H-92

FAA Type Certificate H2SW

FAR Part 27 dated 2 October 1964 Amendment 27-1 through 27-24 with:

27.79, 27.143, 27.173, 27.175, 27.1519, 27.1585, 27.1587 at Amdt 27-1;

27.1093, 27.1545 at Amdt 27-8;

27.45, 27.141, 27.1309 at Amdt 27-20;

27.2, 27.307, 27.337, 27.351, 27.427, 27.501, 27.571, 27.613, 27.629, 27.663, 27.674, 27.685, 27.727, 27.783, 27.807, 27.861, 27.865 at Amdt 27-28;

and 27.391, 27.395, 27.397, 27.681, 27.1357, 27.1361, replaced by 6.220, 6.225, 6.323, 6.623, 6.624, 6.625, 6.626 of CAR Part 6 dated 6 December 1956 Amendment 6-1 through 6-4.

Exceptions to FAR 27 are the deletion of: 27.71, 27.177, 27.399, 27.562, 27.610, 27.954, 27.1195, 27.1322.

Equivalent Safety Findings:

1. Skid Landing Gear (Drop Test) FAR 27.723, 27.725, and 27.727
2. Fuel Tanks (Drop Test)- FAR 27.965(c)(1) and (c)(2). FAR Part 36 dated 3 November 1969 Amendment 36-1 through 36-14, Subpart H.

4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)

Airworthiness Directives applicable to the Bell 206L series have been reviewed and no conflicting AD's were found. See Appendix A.

AD's CF-95-17 and CF-98-43 refer to cracking of the landing gear cross-tubes, found particularly around riveted connections at the saddles, and at the fuselage mounting points. The basket is not mounted to the cross tubes.

The basket installation is unaffected by these AD's.

5.0 LOADS

Tests of the basket itself have been carried out and documented in Test Report ER492.02. Loads on the basket will be broken down into the critical loads on the beams supporting it.

5.1 Inertia Load Factors

BELL 206L4 HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

Ultimate Upward Emergency Landing Load Factor: $n_{e_up} := 1.5$

Ultimate Forward Emergency Landing Load Factor: $n_{e_fwd} := 4.0$

Ultimate Sideward Emergency Landing Load Factor: $n_{e_side} := 2.0$

Ultimate Downward Emergency Landing Load Factor: $n_{e_down} := 4.0$

FAR 27.625 Fitting Factor: $n_{ff} := 1.15$

FAR 27.303 Safety Factor: $n_{sf} := 1.5$

FAR 27.337(a) Limit Positive Manouvering Load Factor: $n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$ Ultimate Positive Manouvering Load Factor: $n_{man_ult} = 5.25$

Limit Negative Manouvering Load Factor: $n_{man_n} := -1.0$

$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$ Ultimate Negative Manouvering Load Factor: $n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Manoeuvring Load Factor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure in the emergency landing condition do not endanger the occupants.

5.2 Inertia Loads

Weight of basket. $W_{basket} = 55 \cdot lbf$

Cargo Capacity of basket. $W_{cargo} = 200 \cdot lbf$

Weight of aft beam. $W_{aft_beam} = 10 \cdot lbf$

Weight of forward beam. $W_{fwd_beam} = 10 \cdot lbf$

$$W_{external} = W_{basket} + W_{cargo} + (W_{aft_beam} + W_{fwd_beam})$$

Total Weight of external installation and cargo. $W_{external} = 275 \cdot lbf$

$$P_{ext} = \left(\frac{W_{basket}}{2} + \frac{2}{3} \cdot W_{cargo} + W_{fwd_beam} \right)$$

Weight of external installation on each beam, assuming 2/3 of max. cargo is at one end. $p_{ext} = 171 \cdot lbf$

5.3 Drag Loads

	Length of basket.	$l_{\text{basket}} := 74 \text{ in}$
	Width of basket.	$w_{\text{basket}} := 22 \text{ in}$
	Height of basket.	$h_{\text{basket}} := 16 \text{ in}$
$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$	Frontal Area of basket.	$A_f = 2.44 \text{ ft}^2$
$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$	Planar Area of basket.	$A_p = 11.3 \text{ ft}^2$
	Fineness ratio of basket	$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$
	Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Figure 22).	$C_{Do} := 1.6$
	Density of air at Sea Level.	$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$
	Never-Exceed-Speed of 206L-4. (Ref. 206L-4 Flight Manual.)	$V_{ne} := 126.5 \text{ knots}$
$V_d := \frac{V_{ne}}{0.9}$	Dive Speed of Bell 206L-4	$V_d = 141 \text{ knots}$
$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$	Drag on basket.	$\text{Drag} = 262 \text{ lbf}$
$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$	Ultimate applied Drag load on basket.	$P_{\text{drag_ult}} = 451 \text{ lbf}$

5.3 Loads on Aft Beam

Both beams hold the basket 38.5" from the helicopter's center of gravity. The forward beam is attached to the fuselage at the fittings spaced 26.6 inches apart. The aft beam is attached at fittings spaced 20.5 inches apart. With attachments closer together, the reaction loads will be higher on the aft beam.

The aft beam is critical.

The basket is mounted to each beam with 2 AN4 bolts. These bolts are represented as "A" and "B" in Figure 5.1. The beam is attached to the helicopter using the External Attachment Provisions incorporated into the landing gear fittings, represented as "C" and "D".

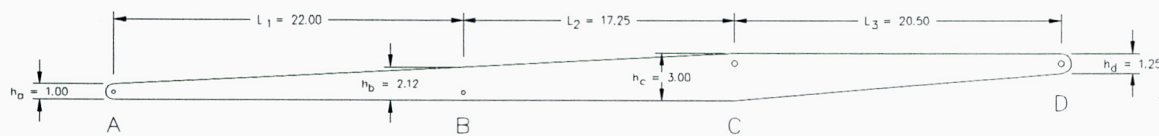


Figure 5.1 Aft Basket Support Beam

5.3.1 Geometry of Aft Beam

~~Weight of aft beam.~~

~~$W_{\text{aft_beam}} := 10 \text{ lbf}$~~

Spacing of basket mounting bolts (A to B).

$L_1 := 22.00 \text{ in}$

Spacing of basket to gear bolts (B to C).

$L_2 := 17.25 \text{ in}$

Spacing of gear mounting bolts (C to D).

$L_3 := 20.50 \text{ in}$

Width of beam.

$w := 1.0 \text{ in}$

Depth of beam at bolt "A".

$h_a := 1.0 \text{ in}$

Depth of beam at bolt "B".

$h_b := 2.12 \text{ in}$

Depth of beam at bolt "C".

$h_c := 3.0 \text{ in}$

Depth of beam at bolt "D".

$h_d := 1.25 \text{ in}$

Beam Properties at "B":

$$I_{x_b} := \frac{w}{12} \cdot (h_b)^3$$

Moment of Inertia of beam cross section at bolt "B" around the longitudinal axis.

$$I_{x_b} = 0.79 \cdot \text{in}^4$$

$$z_b := \frac{h_b}{2}$$

Distance from longitudinal neutral axis to extreme fibre at point "B".

$$z_b = 1.06 \cdot \text{in}$$

$$I_{z_b} := \frac{h_b}{12} \cdot (w)^3$$

Moment of Inertia of beam cross section at bolt "B" around the vertical axis.

$$I_{z_b} = 0.18 \cdot \text{in}^4$$

$$x_b := \frac{w}{2}$$

Distance from vertical neutral axis to extreme fibre at point "B".

$$x_b = 0.50 \cdot \text{in}$$

Beam Properties at "C":

$$I_{x_c} := \frac{w}{12} \cdot (h_c)^3$$

Moment of Inertia of beam cross section at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

$$z_c := \frac{h_c}{2}$$

Distance from longitudinal neutral axis to extreme fibre at point "C".

$$z_c = 1.50 \cdot \text{in}$$

$$I_{z_c} := \frac{h_c}{12} \cdot (w)^3$$

Moment of Inertia of beam cross section at bolt "C" around the vertical axis.

$$I_{z_c} = 0.25 \cdot \text{in}^4$$

$$x_c := \frac{w}{2}$$

Distance from vertical neutral axis to extreme fibre at point "C".

$$x_c = 0.50 \cdot \text{in}$$

5.3.2 Static Loads on Aft Beam

Weight of external installation on each beam, assuming 2/3 of max. cargo is at one end.

$$p_{\text{ext}} = 171 \cdot \text{lbf}$$

$$p_{z_a} := \frac{p_{\text{ext}}}{2}$$

Static vertical load on bolt "A".

$$p_{z_a} = 85 \cdot \text{lbf}$$

$$p_{z_b} := \frac{p_{\text{ext}}}{2}$$

Static vertical load on bolt "B".

$$p_{z_b} = 85 \cdot \text{lbf}$$

Applied Moment around D is counteracted by the reaction load at C. Using M at D = 0, then:

$$M_D := p_{\text{ext}} \left(\frac{L_1}{2} + L_2 + L_3 \right) \quad \text{Moment around "D" applied by vertical load.} \quad M_D = 8328 \cdot \text{in} \cdot \text{lbf}$$

$$p_{Z_c} := \frac{M_D}{L_3} \quad \text{Static vertical load on bolt "C".} \quad p_{Z_c} = 406 \cdot \text{lbf}$$

$$p_{Z_d} := p_{Z_c} - p_{\text{ext}} \quad \text{Static vertical load on bolt "D".} \quad p_{Z_d} = 235 \cdot \text{lbf}$$

5.3.3 Ultimate Manouvering Loads on Aft Beam

$$\quad \text{Ultimate manouvering load factor.} \quad n_{\text{man_ult}} = 5.25$$

$$\quad \text{Fitting Factor.} \quad n_{\text{ff}} = 1.15$$

$$p_{Z_ult} := p_{\text{ext}} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate manouvering load on installation.} \quad p_{Z_ult} = 1031 \cdot \text{lbf}$$

$$M_{B_Z} := p_{Z_ult} \cdot \frac{L_1}{2} \quad \text{Ultimate Bending Moment applied at "B".} \quad M_{B_Z} = 11345 \cdot \text{in} \cdot \text{lbf}$$

$$M_{C_Z} := p_{Z_ult} \cdot \left(\frac{L_1}{2} + L_2 \right) \quad \text{Ultimate Bending Moment applied at "C".} \quad M_{C_Z} = 29137 \cdot \text{in} \cdot \text{lbf}$$

Loads at each bolt are shown in Figure 5.2.

$$p_{Zu_a} := p_{Z_a} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "A".} \quad p_{Zu_a} = 516 \cdot \text{lbf}$$

$$p_{Zu_b} := p_{Z_b} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "B".} \quad p_{Zu_b} = 516 \cdot \text{lbf}$$

$$p_{Zu_c} := p_{Z_c} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "C".} \quad p_{Zu_c} = 2453 \cdot \text{lbf}$$

$$p_{Zu_d} := p_{Z_d} \cdot n_{\text{man_ult}} \cdot n_{\text{ff}} \quad \text{Ultimate vertical load on bolt "D".} \quad p_{Zu_d} = 1421 \cdot \text{lbf}$$

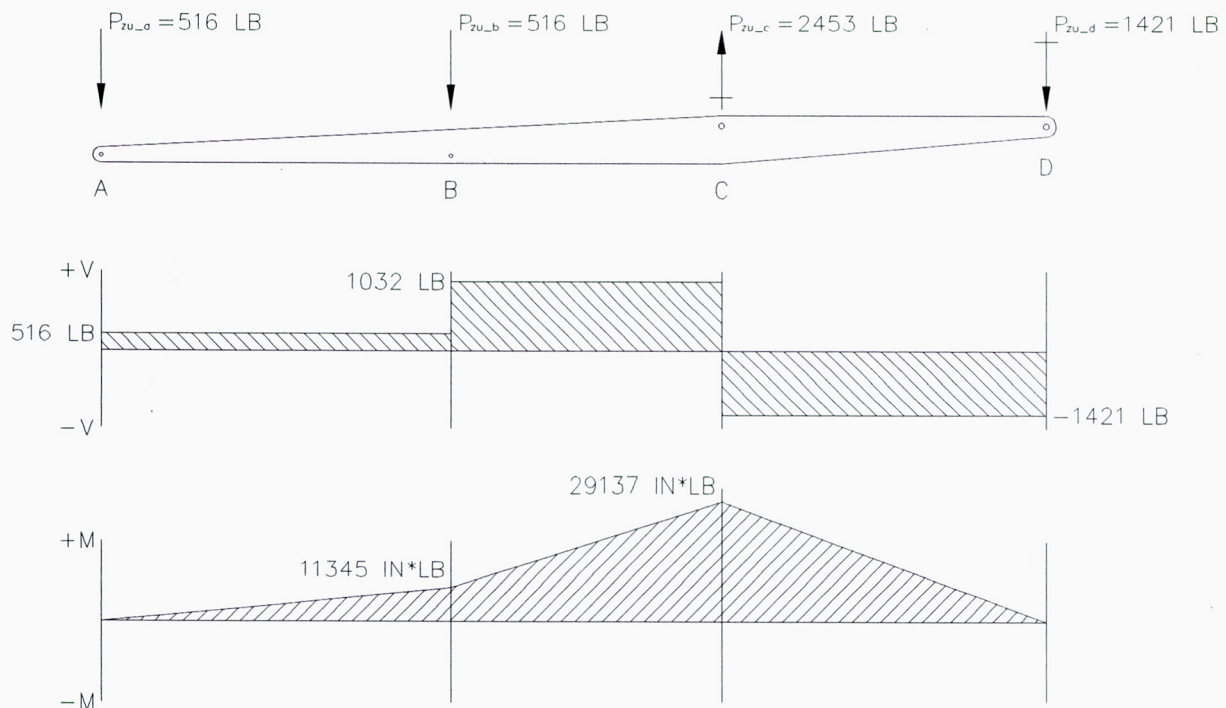


Figure 5.2 Ultimate Manouvering Loads on Aft Beam

5.3.4 Ultimate Drag Loads on Aft Beam

The mounting of the beam does not give the beam freedom to rotate around pin-joints, as it does in the vertical load case. The beam is rigidly held straight by the attachment provisions and by the basket. Assuming infinite rigidity at these attachments is a conservative approximation, where A cannot deflect backward relative to B, and C cannot deflect backward relative to D. The deformation of the beam is shown in Figure 5.3.

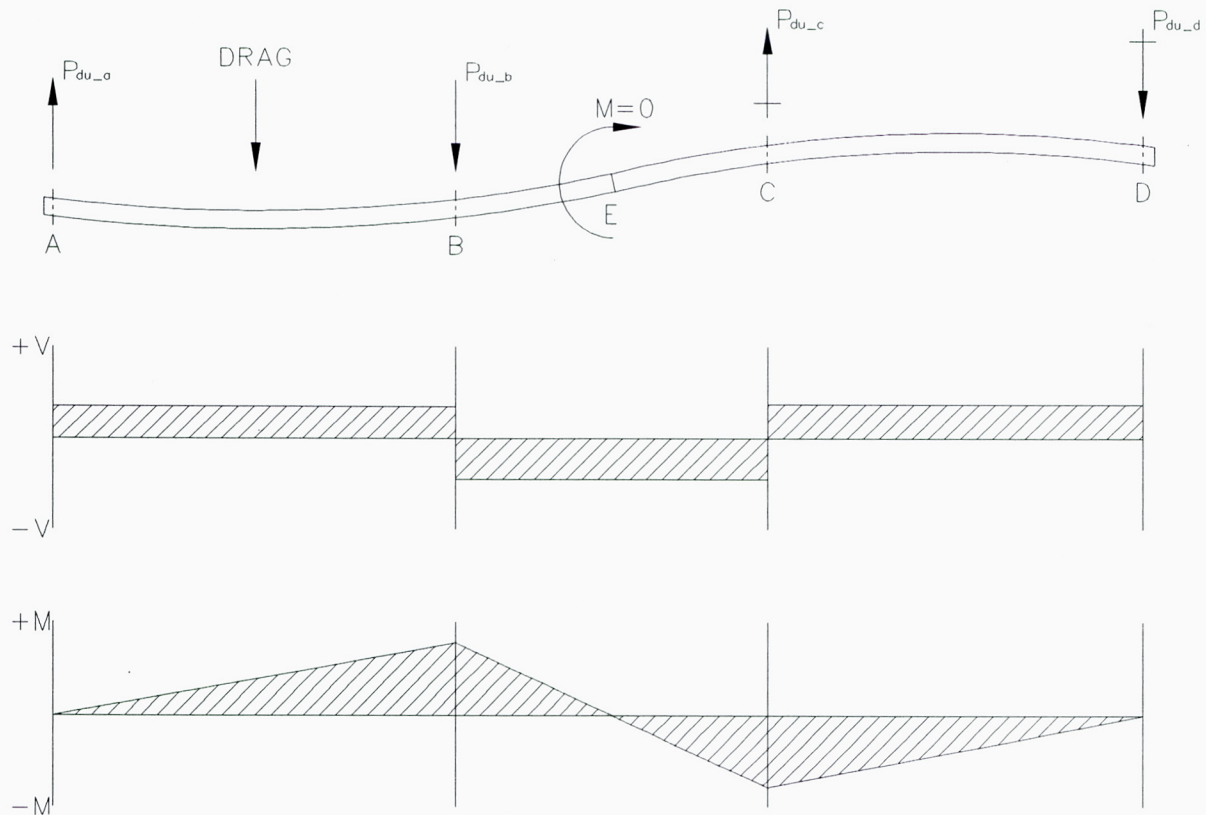


Figure 5.3 Deflection of Aft Beam Under Drag Load

The inflection point in the beam, "E", has the properties of having no bending moment, only shear. This enables another simplification. The shear at "E" is known; it is the ultimate drag load. If the beam was cut at "E", and the shear load applied, as shown in Figure 5.4, then both pieces would have the same reactions as before. The beam is still statically indeterminate, because the position of "E" is not known.

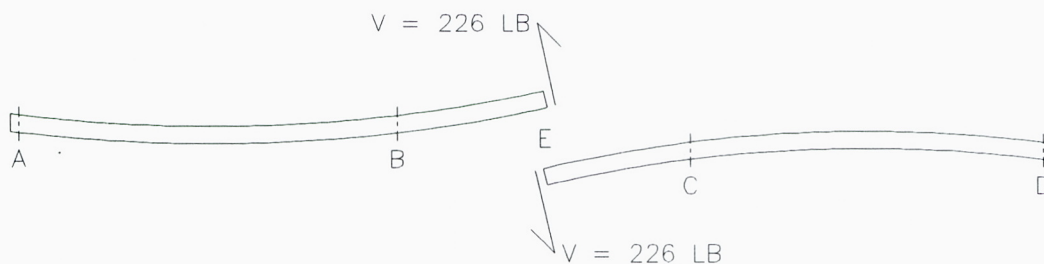


Figure 5.4 Splitting Beam at Inflection Point "E"

To conservatively simplify this problem, the shear at "E" can be applied at "C" for the outboard piece of the beam, and at "B" for the inboard part of the beam. This is shown in Figure 5.5. This ensures that the bending moments are higher than they actually are.

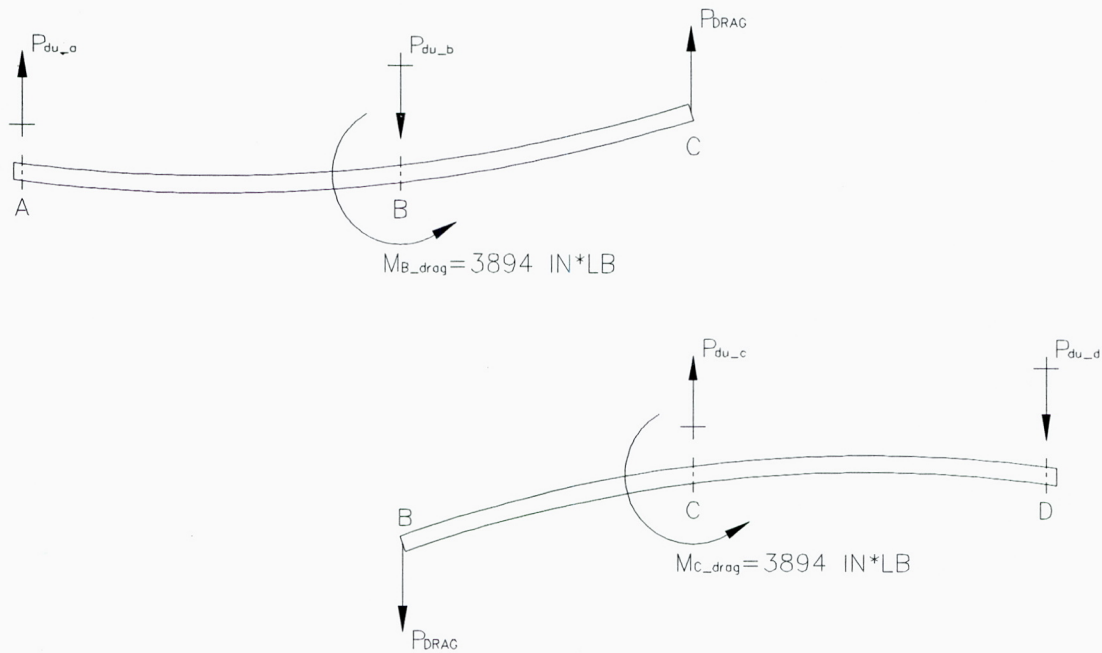


Figure 5.5 Simplification of Drag Loads on Aft Beam

The Aft beam supports half of the total drag load

	Ultimate Aerodynamic Drag Load on basket.	$P_{drag_ult} = 451 \cdot \text{lbf}$
$P_{drag_beam} := \frac{P_{drag_ult}}{2}$	Ultimate Drag Load on each beam.	$P_{drag_beam} = 226 \cdot \text{lbf}$
$M_{B_drag} := P_{drag_beam} \cdot L_2$	Bending moment at "B" due to drag load.	$M_{B_drag} = 3894 \cdot \text{in} \cdot \text{lbf}$
$P_{du_b} := P_{drag_beam} \cdot \frac{L_2 + L_1}{L_1}$	Ultimate drag load at "B".	$P_{du_b} = 403 \cdot \text{lbf}$
$P_{du_a} := P_{drag_beam} \cdot \frac{L_2}{L_1}$	Ultimate drag load at "A".	$P_{du_a} = 177 \cdot \text{lbf}$

$$M_{C_drag} := P_{drag_beam} \cdot L_2$$

Bending moment at "C" due to drag load.

$$M_{C_drag} = 3894 \text{ in} \cdot \text{lb}$$

$$P_{du_c} := P_{drag_beam} \cdot \frac{L_2 + L_3}{L_3}$$

Ultimate drag load at "C".

$$P_{du_c} = 416 \cdot \text{lb}$$

$$P_{du_d} := P_{drag_beam} \cdot \frac{L_2}{L_3}$$

Ultimate drag load at "D".

$$P_{du_d} = 190 \cdot \text{lb}$$

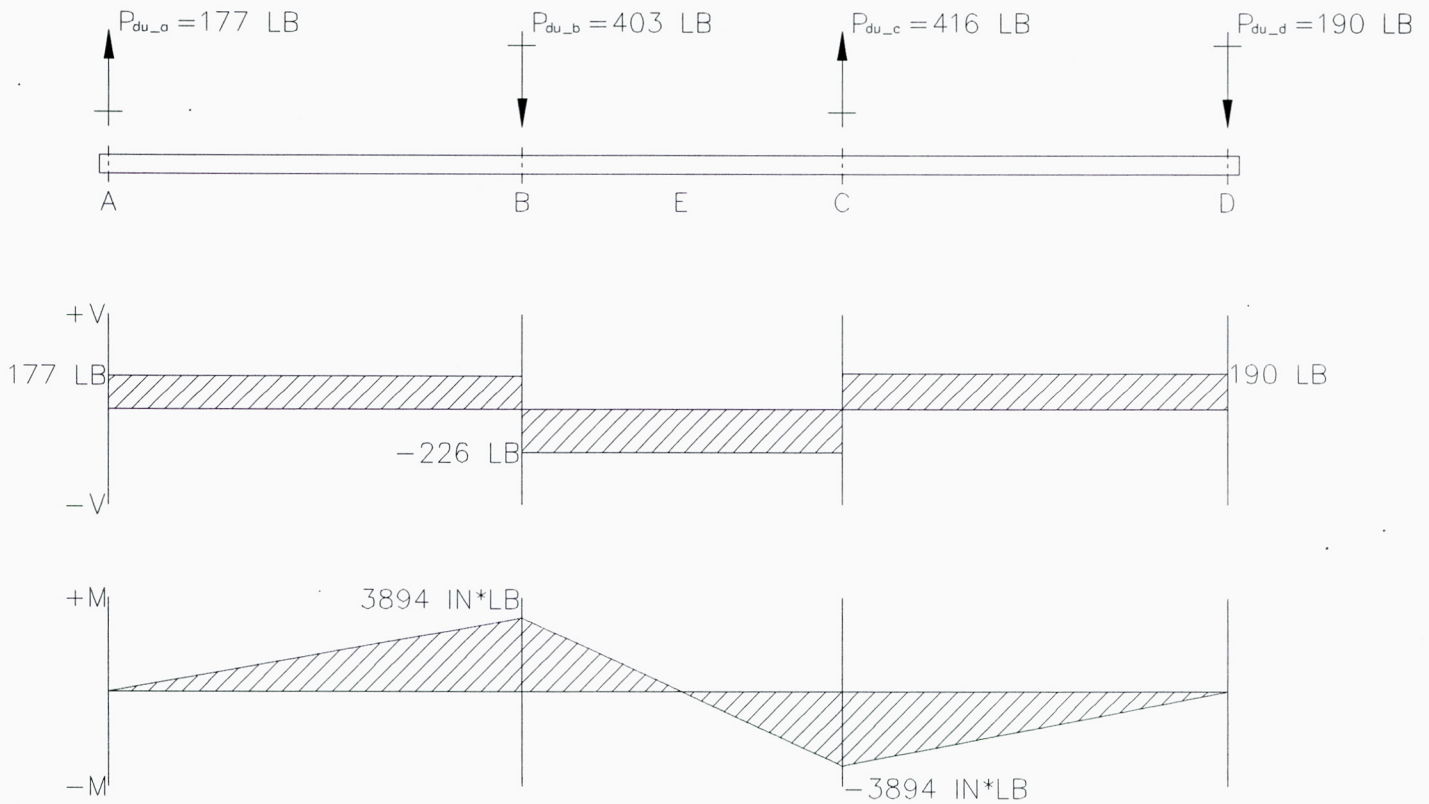


Figure 5.6 Ultimate Drag Loads on Aft Beam

6.0 STRUCTURAL ANALYSIS

6.1 Allowable Strength of External Attachment Provisions

The Manouvering Load and Drag Load are applied simultaneously. According to the limitations of t External Attachment Provisions, the Ultimate Vertical Allowable Load is dependent on the applied ultimate Longitudinal Load. This will be found using the graph in Appendix B of Report ER493.01.

Where: Ultimate drag load at "C". $P_{du_c} = 416 \cdot \text{lbf}$

Then:

$P_{z_ult} := 3413 \text{ lbf} - 0.1756 [2 \cdot (0 \cdot \text{lbf}) + P_{du_c}]$ Allowable Vertical Load on External Attachment Provision (Ref. ER493.01). $P_{z_ult} = 3340 \cdot \text{lbf}$

Allowable Longitudinal Load on External Attachment Provision (Ref. ER493.01). $P_{x_ult} := 2600 \text{ lbf}$

6.2 Allowable Strength of AN4 Bolts

Ultimate Tensile Strength of AN4 Bolt (Ref. Mil-Hdbk-5H) $P_{tu_AN4} := 4170 \text{ lbf}$

Ultimate Shear Strength of AN4 Bolt (Ref. Mil-Hdbk-5H) $P_{su_AN4} := 3682 \text{ lbf}$

6.3 Analysis of AN4 Bolts Fastening Basket to Aft Beam

AN4 Bolt at Point "A".

	Ultimate vertical load on AN4 bolt.	$P_{zu_a} = 516 \cdot \text{lbf}$
	Ultimate Shear Strength of AN4 Bolt.	$P_{su_AN4} = 3682 \cdot \text{lbf}$
$R_s := \frac{P_{zu_a}}{P_{su_AN4}}$	Shear Stress Ratio for AN4 Bolt.	$R_s = 0.14$
	Ultimate Drag load on AN4 bolt.	$P_{du_a} = 177 \cdot \text{lbf}$
	Ultimate Tensile Strength of AN4 Bolt.	$P_{tu_AN4} = 4170 \cdot \text{lbf}$
$R_t := \frac{P_{du_a}}{P_{tu_AN4}}$	Tensile Stress Ratio for AN4 Bolt.	$R_t = 0.04$
$R := R_t^2 + R_s^3$	Combined Stress Ratio for AN4 Bolt.	$R = 0.005$
Where stress factor: $N := 6.92$	Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)	
$MS := N - 1$	Ultimate Margin of Safety (Ref. Mil-Hdbk-5E, 1.5.3.5)	$MS = 5.92$

AN4 Bolt at Point "B".

$$R_s := \frac{P_{zu_b}}{P_{su_AN4}}$$

$$R_t := \frac{P_{du_b}}{P_{tu_AN4}}$$

$$R := R_t^2 + R_s^3$$

Where stress factor: $N := 6.18$

$$MS := N - 1$$

Ultimate vertical load on AN4 bolt.

Ultimate Shear Strength of AN4 Bolt.

Shear Stress Ratio for AN4 Bolt.

Ultimate Drag load on AN4 bolt.

Ultimate Tensile Strength of AN4 Bolt.

Tensile Stress Ratio for AN4 Bolt.

Combined Stress Ratio for AN4 Bolt.

Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)

Ultimate Margin of Safety
(Ref. Mil-Hdbk-5E, 1.5.3.5)

$$P_{zu_b} = 516 \cdot \text{lbf}$$

$$P_{su_AN4} = 3682 \cdot \text{lbf}$$

$$R_s = 0.14$$

$$P_{du_b} = 403 \cdot \text{lbf}$$

$$P_{tu_AN4} = 4170 \cdot \text{lbf}$$

$$R_t = 0.10$$

$$R = 0.012$$

$$MS = 5.18$$

6.4 Analysis of Attachment to External Attachment Provisions

Attachment to Provisionat Point "C".

Ultimate verticalload at "C".

$$P_{zu_c} = 2453 \cdot \text{lbf}$$

Allowable Vertical Load at Provision

$$P_{z_ult} = 3340 \cdot \text{lbf}$$

$$R_s := \frac{P_{zu_c}}{P_{z_ult}}$$

Stress Ratio at "C".

$$R_s = 0.73$$

Ultimate Drag load at "C".

$$P_{du_c} = 416 \cdot \text{lbf}$$

Allowable Longitudinal Load at Provision

$$P_{x_ult} = 2600 \cdot \text{lbf}$$

$$R_t := \frac{P_{du_c}}{P_{x_ult}}$$

Stress Ratio at "C".

$$R_t = 0.16$$

$$R := R_t^2 + R_s^3$$

Combined Stress Ratioat "C".

$$R = 0.422$$

Where stress factor: $N := 1.34$

Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)

$$MS := N - 1$$

Ultimate Margin of Safety
(Ref. Mil-Hdbk-5E, 1.5.3.5)

$$MS = 0.34$$

Attachment to Provision at Point "D".

Ultimate vertical load at "D".

$$P_{zu_d} = 1421 \cdot \text{lb} \cdot \text{f}$$

Allowable Vertical Load at Provision

$$P_{z_ult} = 3340 \cdot \text{lb} \cdot \text{f}$$

$$R_s := \frac{P_{zu_d}}{P_{z_ult}}$$

Stress Ratio at "D".

$$R_s = 0.43$$

Ultimate Drag load at "D".

$$P_{du_d} = 190 \cdot \text{lb} \cdot \text{f}$$

Allowable Longitudinal Load at Provision

$$P_{x_ult} = 2600 \cdot \text{lb} \cdot \text{f}$$

$$R_t := \frac{P_{du_d}}{P_{x_ult}}$$

Stress Ratio at "D".

$$R_t = 0.07$$

$$R := R_t^2 + R_s^3$$

Combined Stress Ratio at "D".

$$R = 0.082$$

Where stress factor: $N := 2.33$

Then: $(N \cdot R_s)^3 + (N \cdot R_t)^2 = 1.00$ (must = 1)

$$MS := N - 1$$

Ultimate Margin of Safety
(Ref. Mil-Hdbk-5E, 1.5.3.5)

$$MS = 1.33$$

6.5 Beam Strength

Combined Bending Stress due to Manouvering Load and Drag Load at "B".

Ultimate Bending Moment at "B"
due to Manouvering Load.

$$M_{B_z} = 11345 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "B" around the longitudinal axis.

$$I_{x_b} = 0.79 \cdot \text{in}^4$$

Distance from longitudinal neutral axis
to extreme fibre at point "B".

$$z_b = 1.06 \cdot \text{in}$$

Ultimate Bending Moment at "B"
due to Drag Load.

$$M_{B_drag} = 3894 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "B" around the vertical axis.

$$I_{z_b} = 0.18 \cdot \text{in}^4$$

Distance from vertical neutral axis
to extreme fibre at point "B".

$$x_b = 0.50 \cdot \text{in}$$

$$f_{b_z} := \frac{M_{B_z} \cdot z_b}{I_{x_b}}$$

Vertical Bending stress applied to beam at "B". $f_{b_z} = 15.1 \cdot \text{ksi}$

$$f_{b_drag} := \frac{M_{B_drag} \cdot x_b}{I_{z_b}}$$

Drag Bending stress applied to beam at "B". $f_{b_drag} = 11.0 \cdot \text{ksi}$

$$f_{b_comb} := f_{b_z} + f_{b_drag}$$

Combined Bending stress applied to beam
at "B". (Stresses are additive in rectangular
cross-section, ref. Bruhn, A13)

$$f_{b_comb} = 26.2 \cdot \text{ksi}$$

Ultimate Tensile Strength of 6061-T651
aluminum bar. (ref. Mil-Hdbk-5H)

$$F_{tu_6061} = 42 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061}}{f_{b_comb}} - 1$$

Bending Margin of Safety.

$$MS = 0.61$$

Combined Bending Stress due to Manouvering Load and Drag Load at "C".

Ultimate Bending Moment at "C"
due to Manouvering Load.

$$M_{C_z} = 29137 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the longitudinal axis.

$$I_{x_c} = 2.25 \cdot \text{in}^4$$

Distance from longitudinal neutral axis
to extreme fibre at point "C".

$$z_c = 1.50 \cdot \text{in}$$

Ultimate Bending Moment at "C"
due to Drag Load.

$$M_{C_{\text{drag}}} = 3894 \cdot \text{in} \cdot \text{lbf}$$

Moment of Inertia of beam cross section
at bolt "C" around the vertical axis.

$$I_{z_c} = 0.25 \cdot \text{in}^4$$

Distance from vertical neutral axis
to extreme fibre at point "C".

$$x_c = 0.50 \cdot \text{in}$$

$$f_{b_z} := \frac{M_{C_z} \cdot z_c}{I_{x_c}}$$

Vertical Bending stress applied to beam at "C". $f_{b_z} = 19.4 \cdot \text{ksi}$

$$f_{b_{\text{drag}}} := \frac{M_{C_{\text{drag}}} \cdot x_c}{I_{z_c}}$$

Drag Bending stress applied to beam at "C". $f_{b_{\text{drag}}} = 7.8 \cdot \text{ksi}$

$$f_{b_{\text{comb}}} := f_{b_z} + f_{b_{\text{drag}}}$$

Combined Bending stress applied to beam
at "C". (Stresses are additive in rectangular
cross-section, ref. Bruhn, A13)

$$f_{b_{\text{comb}}} = 27.2 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061}}{f_{b_{\text{comb}}}} - 1$$

Bending Margin of Safety.

$$MS = 0.54$$

APPENDIX A

AIRWORTHINESS DIRECTIVES APPLICABLE TO THE BELL 206L SERIES

AIRWORTHINESS DIRECTIVES

Applicable to Canadian registered or manufactured aeronautical products

Database Last Updated: 2002-03-16

Directives Pertaining to Model: **BELL, 206L**

40 ADs found

Country:	AD Number:	AD Subject:	SB Reference:
CF	<u>CF-2001-33</u>	CHIP DETECTOR ASSEMBLY	206-01-96 REV A
CF	<u>CF-2001-13</u>	SOLOY ENGINE RPM SENSOR	SOLOY 02-680R2
CF	<u>CF-2000-13</u>	COLLECTIVE LEVER - RAISED FORGING BOSS	ASB 206-00-93
CF	<u>CF-98-43</u>	CROSSTUBE ASSEMBLIES	
CF	<u>CF-98-27</u>	TAILBOOM MODIFICATION	ASB 206L-87-47 REV C
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21
CF	<u>CF-1998-42R4</u>	CRACKED TAIL BOOM SKIN	206L-99-115 REV E
CF	<u>CF-97-03</u>	MAST AND TRUNNION RETIREMENT LIFE	
CF	<u>CF-96-11</u>	FUEL CELL VENT TUBE - WATER INGESTION	206-95-156
CF	<u>CF-95-19</u>	TEMP-PLATES OVERHEAT INDICATORS	ASB 206L-93-91 REV B
CF	<u>CF-95-17</u>	CROSSTUBE FAILURES	AA-ASB 94045/94046
CF	<u>CF-95-11R2</u>	UNAPPROVED BOLTS, FLIGHT CONTROL SERVO ACTUATORS	206-67-02,206-67A-01
US	<u>95-09-06</u>	INADVERTANT FUEL VALVE SWITCH POSITIONING	206-90-54/206L-90-67
US	<u>94-24-11</u>	TAIL ROTOR DRIVESHAFT MISALIGNMENT	206-92-69/206L-92-84
US	<u>94-20-03</u>	MAIN ROTOR HUB TRUNNION	206L-93-90
US	<u>94-19-02</u>	SWASHPLATE SUPPORT ASSEMBLY	206-93-74 REV B
US	<u>94-15-07</u>	MAIN ROTOR BLADES CRACKS	ASB 206-93-77
US	<u>92-06-12</u>	MAIN TRANSMISSION SUNGEAR	206-90-56,206L-90-69
US	<u>92-01-05</u>	MAIN ROTOR BLADES (FALSIFIED COMPONENT RECORDS)	
US	<u>91-23-15</u>	ENGINE RPM SENSOR	SOLOY 02-680
US	<u>91-03-12</u>	EMERGENCY FLOAT BAGS	206L-89-63,206-89-49
US	<u>90-21-03</u>	TAIL ROTOR BLADE TIP WEIGHT	
US	<u>90-13-01R1</u>	TAIL ROTOR BLADES	
US	<u>89-22-01R1</u>	MAIN ROTOR BLADES	
US	<u>89-20-13</u>	HORIZONTAL STABILIZER	
US	<u>88-26-03</u>	FUEL SYSTEM FLOW SWITCHES	206L-88-52
US	<u>88-23-03</u>	TAIL ROTOR YOKE ASSEMBLY	
US	<u>87-10-11</u>	MAIN ROTOR MAST	206-87-37, -44
US	<u>86-24-01</u>	TAIL ROTOR YOKE	
US	<u>85-26-06</u>	TAIL ROTOR BLADES	
US	<u>85-25-01</u>	CYCLIC CONTROL STICK	206-85-29,206L-85-36
US	<u>85-09-04</u>	MAIN ROTOR BLADES	ASB 206L-85-35
US	<u>83-03-04</u>	CHECK OF SHEAR HEADS-FLOAT INFLATION VALVES	SB 206L-81-21
US	<u>82-16-12</u>	WITH CHADWICK C-22 AFS PER STC SH139W	CHADWICK SB 20-81-01
US	<u>82-05-03</u>	HORIZONTAL STABILIZER ASSEMBLY	ASB 206L-81-23 REV A
US	<u>80-18-04R1</u>	MAIN ROTOR TRUNNION	ASB 206L-80-9 REV A
US	<u>80-17-05</u>	TAIL ROTOR BLADES	
US	<u>78-24-06R1</u>	HORIZONTAL STABILIZER	
US	<u>78-11-02R1</u>	M/R BLADE STRAPS	
US	<u>76-14-05</u>	FUEL SYSTEM COMPONENTS	

CF-95-17 BELL

Applies to all models of Bell 206 series helicopters equipped with the following crosstube assemblies (crosstubes):

- (i) Aeronautical Accessories Inc. P/N 206-320-101 and -102
206-321-001 and -002
206-323-*
206-325-*
206-328-*
206-329-001 and -002
- (ii) Airborne Supply Inc. P/N AB206-050-107 and -119*
AB206-053-109*
- (iii) Bell Helicopter Textron P/N 206-050-107, -119, -134, -157 and 169*
206-053-109, -119 and -129*

(iv) Other manufacturers, as approved by the P/N Any of the above
Federal Aviation Administration (FAA)
under Parts Manufacturer Approval (PMA)

*All dash numbers

Compliance is required as indicated.

Two accidents have been attributed to crosstube failures. There has also been a number of reports of cracks due to corrosion or metal fatigue that might cause a failure of the crosstubes. On the crosstubes of older design, the cracks were mostly found at the rivet holes in the attachment-to-fuselage area and at the saddle attachment. On the newer, clamp-on tubes without holes, the cracks were mostly found in the saddle attachment area and along the line where the clamp touches the tube. Helicopters operating in a corrosive environment, or being used in a training or sightseeing role involving frequent landings are most affected.

To prevent failure of the affected crosstubes accomplish either Part I or Part II below, depending on the type of crosstube:

Part I For Aeronautical Accessories Inc. Crosstubes

A. For Model 206A and 206B Helicopters:

1. Initially, within the next 100 hours time-in-service, unless already accomplished, perform an inspection as per Aeronautical Accessories Inc. Alert Service Bulletin (ASB) No. 94045, Revision B dated 17 April 1995.
2. Not later than 1 February 1996, incorporate into the operator's aircraft inspection program the procedures of Report No. AA-94022, Revision G or later revision, as referenced in ASB No. 94045, Revision B. The required procedures shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

B. For Model 206L, 206L-1, -3 and -4 Helicopters:

1. Initially, within the next 100 hours time-in-service, unless already accomplished, perform an inspection as per Aeronautical Accessories Inc. ASB No. 94046, Revision B dated 17 April 1995.
2. Not later than 1 February 1996, incorporate into the operator's aircraft inspection program the procedures of Report No. AA-94023, Revision D or later revision, as referenced in ASB No. 94046, Revision B. The required procedures shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

Part II For All Other Affected Crosstubes

1. Initially, within the next 100 hours time in service, perform a detailed visual inspection of the crosstubes for cracks and corrosion, using a 10-power magnifying glass. Pay particular attention in the strap and the saddle attachment area for mechanical damage and corrosion which could lead to cracks. If there is any indication of cracks or corrosion, remove the paint in suspected areas and perform the detailed visual inspection. If the crosstube has rivet holes in the attachment-to-fuselage area, visually check using a 10-power magnifying glass for cracks emanating from the rivets holes. Refer to the applicable Maintenance Manual for inspection limits. In the absence of manufacturer's limits, the maximum allowable depth of corrosion is limited to 0.005 inch over an area not exceeding one-fourth the circumference by 3 inches in length after cleanup, regardless of location. If any crosstube is found corroded beyond the maximum allowable limit, or cracked, replace the part with a serviceable one before further flight.

2. Not later than 1 February 1996, incorporate the requirements of paragraph 1 above in the operator's aircraft inspection program. The required inspection shall be repeated at each annual or 300-hour scheduled inspection, whichever comes first.

Note: The amendments to the aircraft inspection program, required by Parts I and II above, eliminate the requirement to record in the aircraft records the intervals of this directive and the repeat certification of accomplishment in accordance with Airworthiness Manual Chapter 575.

This inspection task insertion is to include the following:

"AD CF-95-17 refers. This task is not to be escalated or removed from the inspection program without approval by Transport Canada, Chief Continuing Airworthiness, Ottawa."

Replacement of affected crosstubes with later part number crosstubes constitutes terminating action for the inspection requirements of this directive.

Alternative means of compliance with the requirements of this directive may be used only if approved by the Director, Airworthiness Branch, Transport Canada, Ottawa. Any application should be made to the appropriate regional office.

This airworthiness directive (AD) supersedes Federal Aviation Administration (FAA) AD 95-11-14. It also supersedes Transport Canada Alleviation No. AARDG 95/A90, issued to operators of Canadian registered Bell 206 helicopters on 16 June 1995.

This directive becomes effective 9 January 1996.

CF-98-43 BELL

Applies to all Bell Helicopter Textron Canada (BHTC) Model 206 series helicopters equipped with crosstube assemblies (crosstubes) of older design having rivet holes in the support area designated for rivet-on supports with the following, but not limited to, part numbers:

- (i) Aeronautical Accessories Inc. 206-321-001 and -002
- (ii) Airborne Supply Inc. AB206-050-107-025 and -027
 AB206-050-119-005 and -007
- (iii) Bell Helicopter 206-050-107-011, -013, -025 and -027
 206-050-119-001, -003, -005 and -007
 206-050-134-001, -003, -005, -007, -009 and -011
 206-050-169-001, -003, -011 and -013
 206-053-109-001, -003, -005 and -007
 206-053-119-001 and -003
 206-053-129-009, -011, -101 and -103
- (iv) Other manufacturers, as approved by Any of the above the Federal Aviation
Administration (FAA) under Parts Manufacturer Approval (PMA)

Note: The riveted crosstubes of newer configurations, P/N 206-050-2xx-xxx and 206-053-2xx-xxx, having rivet holes only on the sides of the crosstube, are not affected by this directive.

Compliance is required as indicated, unless already accomplished.

The older versions of riveted crosstubes were subject to fatigue cracking; the large majority of cracks started at the top rivet holes under the support assemblies. A few started elsewhere at corrosion or mechanically damaged initiation points. Two accidents have been attributed to crosstubes breaking from cracks starting at the rivet holes. Since the issue of Airworthiness Directive CF-95-17, which introduced inspections, a total failure of an aft crosstube occurred just 40 hours air time after it was properly inspected. The crack had gone undetected under the strap assembly until progressing rapidly once near the strap's edge. Therefore, these older riveted configurations need to be retired within a reasonable time in service.

To prevent a possible catastrophic failure of the crosstube assemblies accomplish the following:

1. Within the next 100 hours air time after the effective date of this directive, remove from the helicopter any crosstube of unknown history or having a total of six or more years in service.
2. No later than 31 December 2000, remove any of the affected crosstubes, regardless of time in service.

This directive becomes effective 15 February 1999.

APPENDIX B

DRAG COEFFICIENTS FOR BLUNT-ENDED RECTANGULAR BODIES

HOERNER, FLUID DYNAMIC DRAG, PAGE 3-12, FIGURE 22

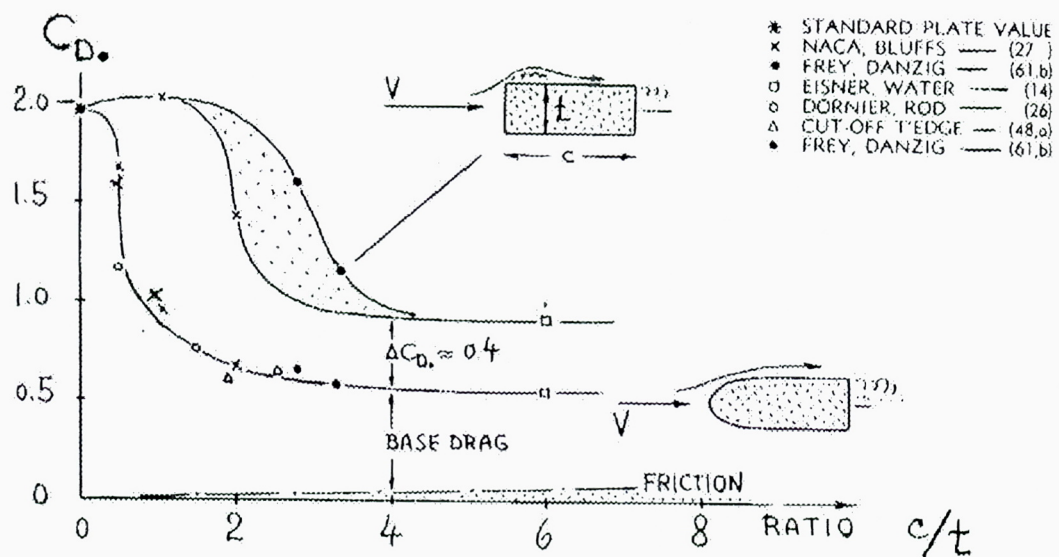


Figure 22. Drag coefficient of "rectangular" sections (tested between walls) with blunt leading edge (upper part) and with rounded shape (lower part), against length ratio.

AERO Design Ltd.

TEST REPORT TR362.02

EXTERNAL SIDE-MOUNTED HELI-SKI BASKET

BELL 407 HELICOPTER

Approved: E. Burgoin, P. Eng.

Date: 11 Nov., 1999

Revision: 1, 27 October, 2000
Revision 2, 4 December, 2000

AERO Design Ltd.: Mailing Address: 1045 McTavish Road N E, Calgary Alberta T2E 7G9
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1.0 INTRODUCTION

The cargo basket installation consists of a basket assembly of welded tube and mesh construction supported and attached to the helicopter by two machined aluminum beams. The machined aluminum beams and their attachment to the helicopter are shown to be compliant with the structural regulatory requirements by analysis in AERO Design Ltd. engineering report ER362.01. The welded basket assembly is difficult to analyze numerically and is substantiated by test in this report. The scope of this report is limited to the welded basket assembly.

2.0 REFERENCE

AERO Design Ltd. drawing 36201.

3.0 BASIS OF CERTIFICATION

FAR 27 at amendment 30

4.0 PURPOSE OF TEST

The load tests are to demonstrate compliance with the following conditions:

- a) Limit and ultimate aerodynamic drag load at V_{ne} . (Less critical than b))
- b) Limit and ultimate aerodynamic drag at V_{ne} combined with limit and ultimate positive maneuvering load.
- c) Negative maneuvering load. (Lid stays closed)
- d) Emergency landing loads. (Lid stays closed, mesh does not fail)

5.0 LOADS

5.1 Maneuvering Load

Maneuvering Loads Required for Test

$$W_b := 50 \text{ lbf}$$

Weight of basket

$$W_l := 200 \text{ lbf}$$

Weight of cargo load

$$n_m := 3.5$$

Limit positive maneuvering load factor

$$n_{m_neg} := -1.0$$

Limit negative maneuvering load factor

$$n_{sf} := 1.5$$

Safety factor

Limit Maneuvering Load

$$P_m := W_l n_m + W_b (n_m - 1)$$

Limit maneuvering test load

$$P_m = 825 \text{ lbf}$$

$$P_{m_neg} := W_l n_{m_neg}$$

Limit negative maneuvering test load

$$P_{m_neg} = -200 \text{ lbf}$$

Ultimate Maneuvering Load

$$P_{m_ult} := W_l (n_m n_{sf}) + W_b [(n_m n_{sf}) - 1]$$

Ultimate maneuvering test load

$$P_{m_ult} = 1263 \text{ lbf}$$

$$P_{m_neg_ult} := P_{m_neg} n_{sf}$$

Ultimate negative maneuvering test load

$$P_{m_neg_ult} = -300 \text{ lbf}$$

5.2 Aerodynamic Drag Load

To determine a satisfactory coefficient of drag on the basket, "Fluid Dynamic Drag", by Hoerner, was used. Figures 21 and 22 from Chapter 3 are coefficient of drag curves for round and square bodies. The basket has a fineness ratio of approximately 4.5, and its front surface is neither square nor round, nor is it perpendicular to the airflow. Both figures give $C_{d0} \sim 0.8 - 0.9$, therefore it can be assumed that the differing assumptions in the two tables have negligible effects and that the drag on the basket will not be greater than 1.0. A drag coefficient of $C_d = 1.5$ will be used to make the analysis of the basket conservative.

$C_d := 1.5$ Coefficient of Drag, conservatively overestimated

$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$ Density of air at sea level

$V_{ne} := 140 \text{ knots}$ Never Exceed Speed of the Bell 407

$n_{sf} := 1.5$ Safety Factor, Ref. 27.303

$w_{\text{basket}} := 22.0 \text{ in}$ Width of the basket face

$h_{\text{basket}} := 21.0 \text{ in}$ Height of the basket face

$S_{\text{basket}} := w_{\text{basket}} \cdot h_{\text{basket}}$

$S_{\text{basket}} = 3.21 \cdot \text{ft}^2$ Surface Area of the basket face.

$V_d := \frac{V_{ne}}{0.9}$

$V_d = 179 \text{ mph}$ Design Speed of the Bell 407, Ref. FAR 27.1505

$D_{\text{basket}} := \frac{1}{2} \cdot \rho \cdot V_d^2 \cdot S_{\text{basket}} \cdot C_d$

$D_{\text{basket}} = 394.4 \cdot \text{lbf}$ Aerodynamic Drag on basket face at V_d

$P_{\text{ult_drag_vne_basket}} := D_{\text{basket}} \cdot n_{sf}$

$P_{\text{ult_drag_vne_basket}} = 591.7 \cdot \text{lbf}$ Ultimate Drag load on basket face at V_d

5.3 Forward Emergency Landing Load

In an emergency landing, the contents of the basket may be forced forward at up to 8 g's.

$$W_{\text{cargo}} := 200 \text{ lbf}$$

Maximum weight of cargo.

$$n_{\text{fwd_emerg}} := 8.0$$

Ultimate forward emergency landing load fact

$$P_{\text{fwd_emerg}} := W_{\text{cargo}} \cdot n_{\text{fwd_emerg}}$$

$$P_{\text{fwd_emerg}} = 1600 \text{ lbf}$$

Ultimate forward emergency landing load

The cargo in the basket can be expected to shift forward and press upon the mesh of the front face. Failure of the front mesh could allow the cargo to slide forward and block the pilot's door, preventing him from escaping. The mesh can be bent outward permanently by the load. This is acceptable, because it will not interfere with the opening of the door, which swings away from the basket.

5.4 Sideward Emergency Landing Load

The occupants of the helicopter are not put into jeopardy by objects escaping outward from the basket during an emergency landing. There is a hazard from objects escaping from the basket in flight and entering the tail rotor of the helicopter. To prevent this event, the handle will be shown to remain closed and locked when it is subjected to a 2g sideward load.

5.5 Upward Emergency Landing Load

Since the occupants of the helicopter are not put into jeopardy by objects escaping upward from the basket during an emergency landing, this load condition is not critical.

6.0 TEST SET-UP

The basket assembly was supported on a workshop table, with square members under the two basket frames that attach the basket to the machined aluminum support beams. A $\frac{1}{4}$ " thick piece of flat iron was clamped to the one square member at the end of the basket to prevent movement of the basket in a longitudinal direction by contact with the basket frame normally attached to a machined aluminum beam. The basket assembly was held in place only by gravity and the piece of $\frac{1}{4}$ " flat iron and no bolting was used.

The aerodynamic drag was simulated by applying a load from a come-along through a dynamometer using a chain around the basket. The load was applied along the longitudinal axis of the basket and resisted by the piece of $\frac{1}{4}$ " flat across the end frame of the basket. This resulted in all of the drag load being resisted by one frame, which is conservative since the drag load in the actual helicopter installation is divided between two frames. The chain applied load to one end of the basket through a $\frac{1}{2}$ " thick aluminum plate, that was used to distribute the load over the entire end of the basket and prevent damage to the mesh material due to concentrated loads, but which otherwise played no other role in support of the basket. The load was applied slightly above the centre line of the basket.

The maneuvering load was simulated by loading the basket assembly with sand bags and lead shot.

The maneuvering load and drag loads were applied simultaneously.

The test set-up is shown in the following photographs.



Figure 6.1 Plate Fastened to Aft Basket Face to Apply Drag Load

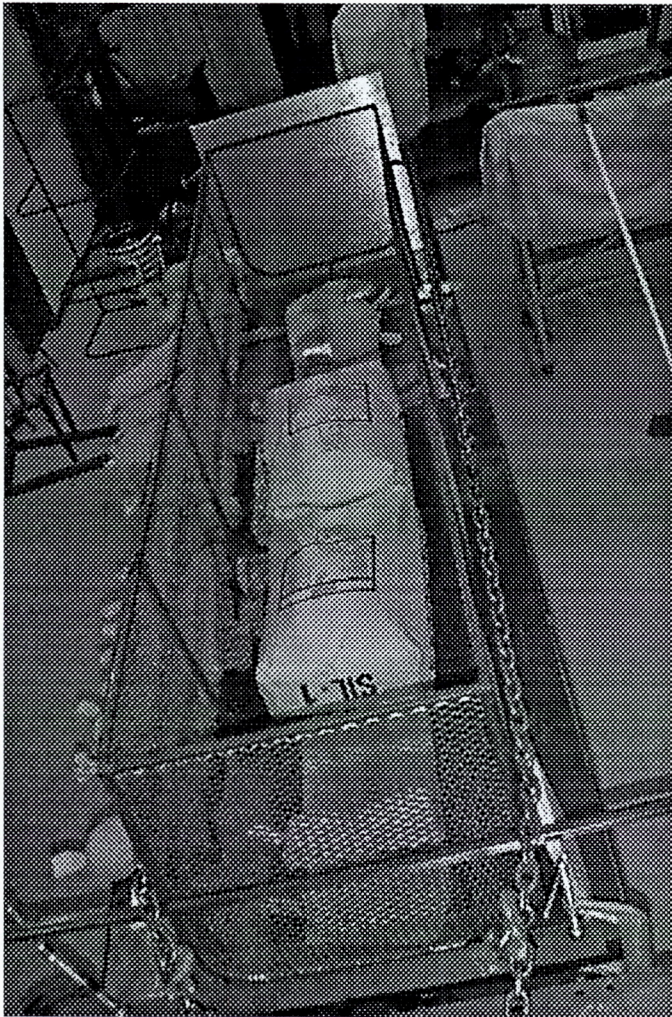


Figure 6.2
Sand Bags to Apply Manouvering
Load

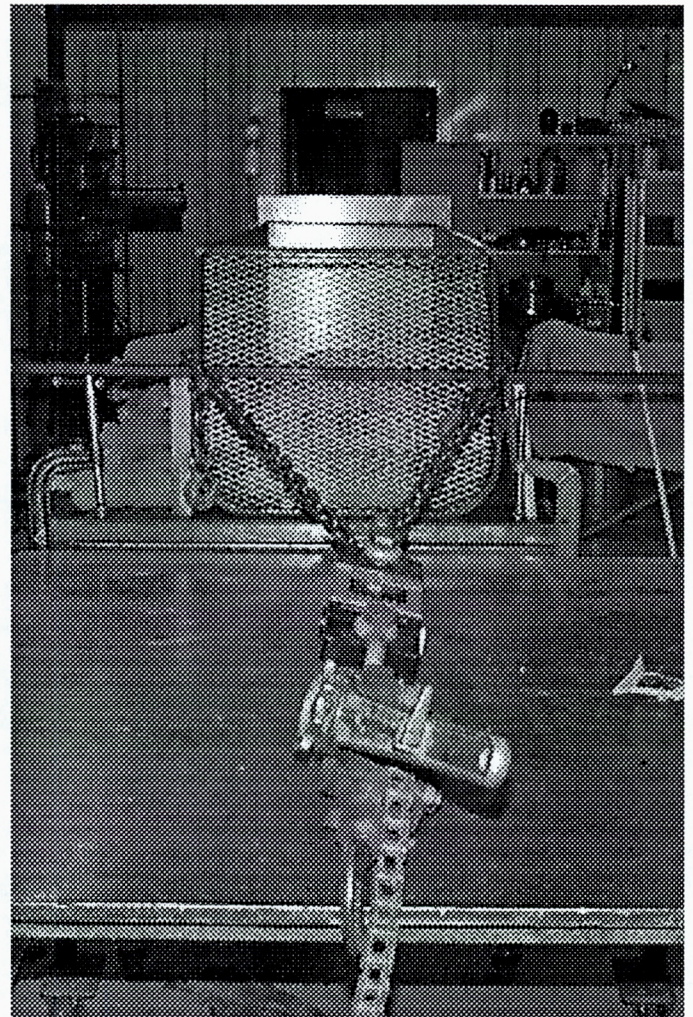


Figure 6.3
Chain And Come-Along to
Apply Drag Load

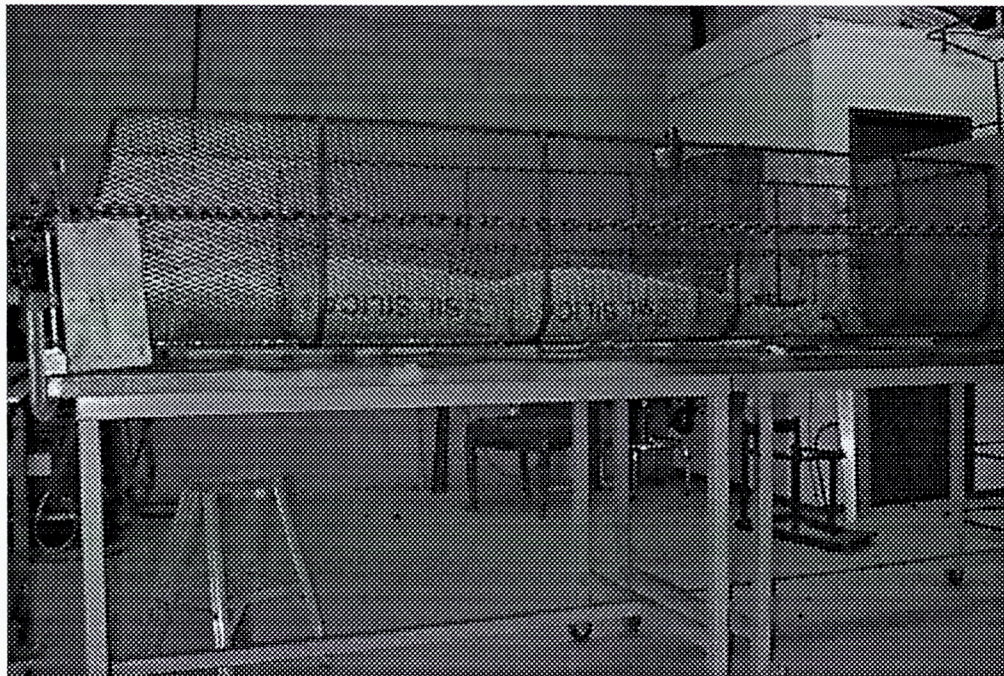


Figure 6.4 Clearance of Basket Over Table Prior to Test

7.0 LOAD TESTS

7.1 Aerodynamic Drag Limit and Ultimate Loading at V_{ne}

This load condition is less critical than the combined drag and maneuvering load condition tested in Section 7.2.

7.2 Combined Drag at V_{ne} and Positive Maneuvering Loading

Limit Load Condition

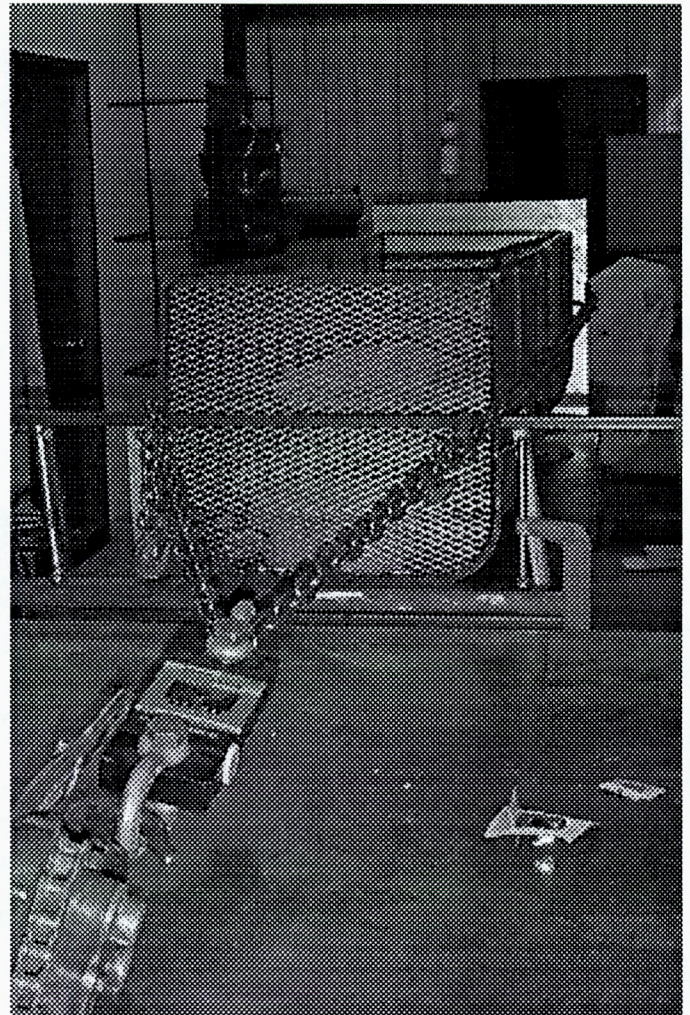
A drag load of 450 lb was applied by the come-along simultaneously with a positive maneuvering load of 850 lb. by loading the basket with sand bags and lead shot.

There were no signs of significant deflections or permanent deformation resulting from the application of these loads.

Ultimate Load Condition

An ultimate drag load of 730 lb was applied by the come-along simultaneously with an ultimate positive maneuvering load of 1276 lb. by loading the basket with sand bags (2 @ 40 kg. each) and lead shot (44 @ 25 lb. each). The load was applied for approximately 5 minutes.

The basket assembly did not fail and there were no signs of permanent deformation resulting from the application of these loads.



Figures 7.1 and 7.2 Come-Along Applying Drag Test Load = 730 Pounds

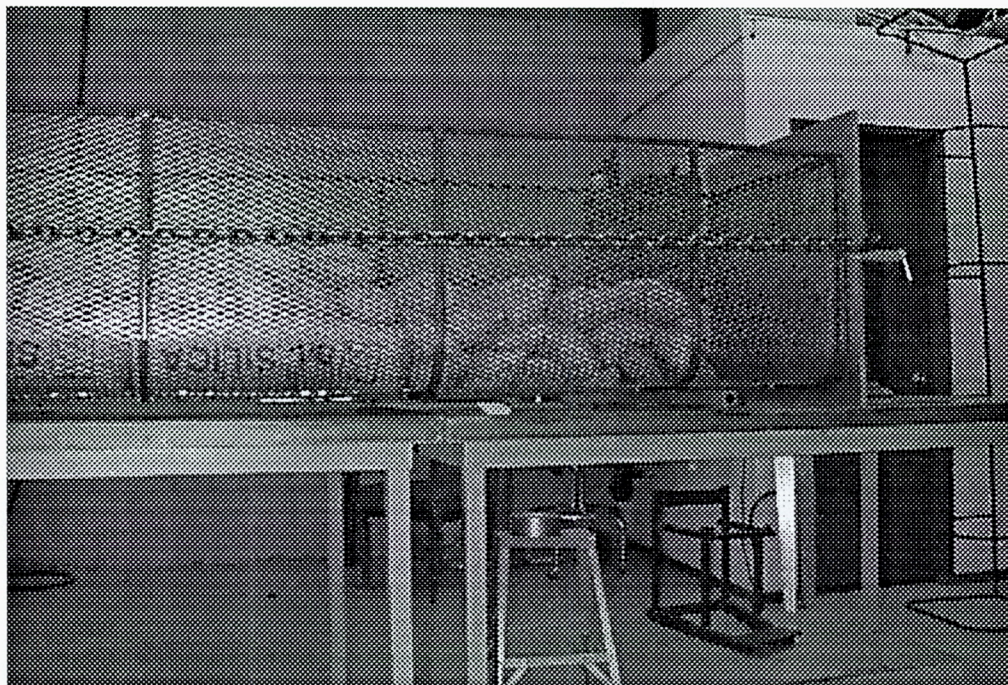
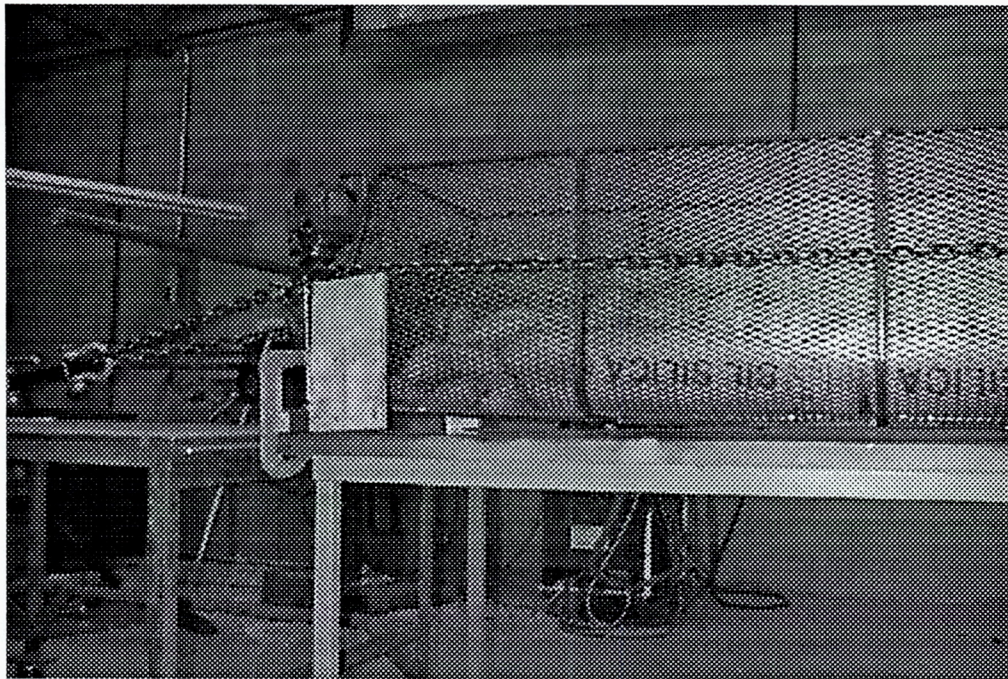


Figure 7.3 Sandbags and Lead Shot Bags Applying
Manouvering Test Load = 1276 Pounds

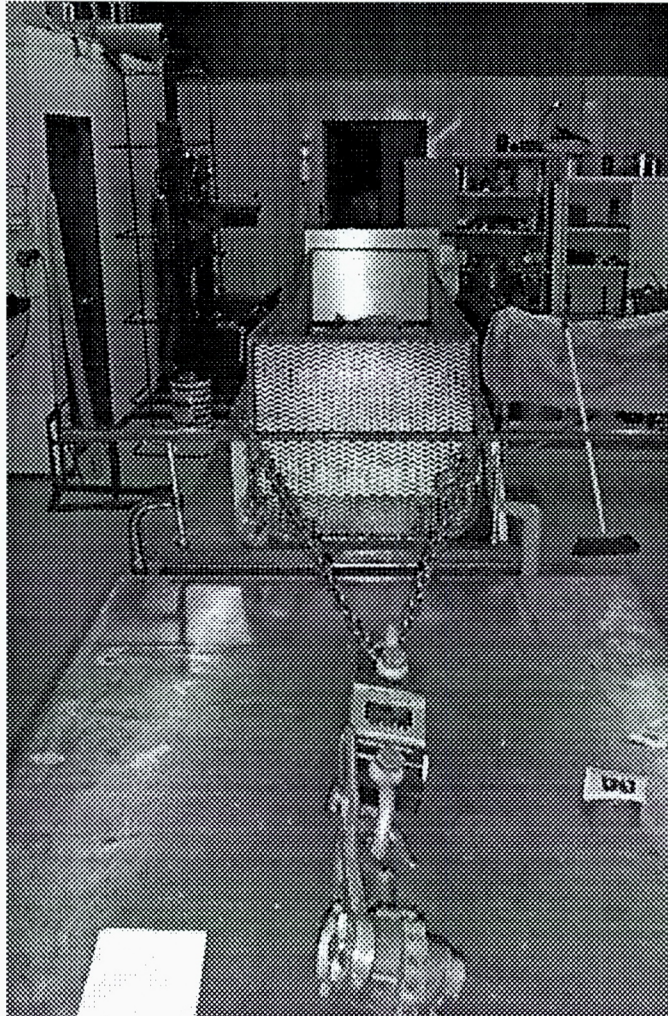


Figure 7.4 Manouvering Test Load and Aerodynamic Drag Test Load
Applied Simultaneously

Required Manouvering Load = 592 Pounds

Required Aerodynamic Drag Load = 1263 Pounds

Margin of Safety = Positive

7.3 Negative Maneuvering Load Test

The basket was supported upside-down with twelve bags of lead shot resting on the lid, 6 near each clamp, to apply the ult. neg. man. load. The lid did not fail.

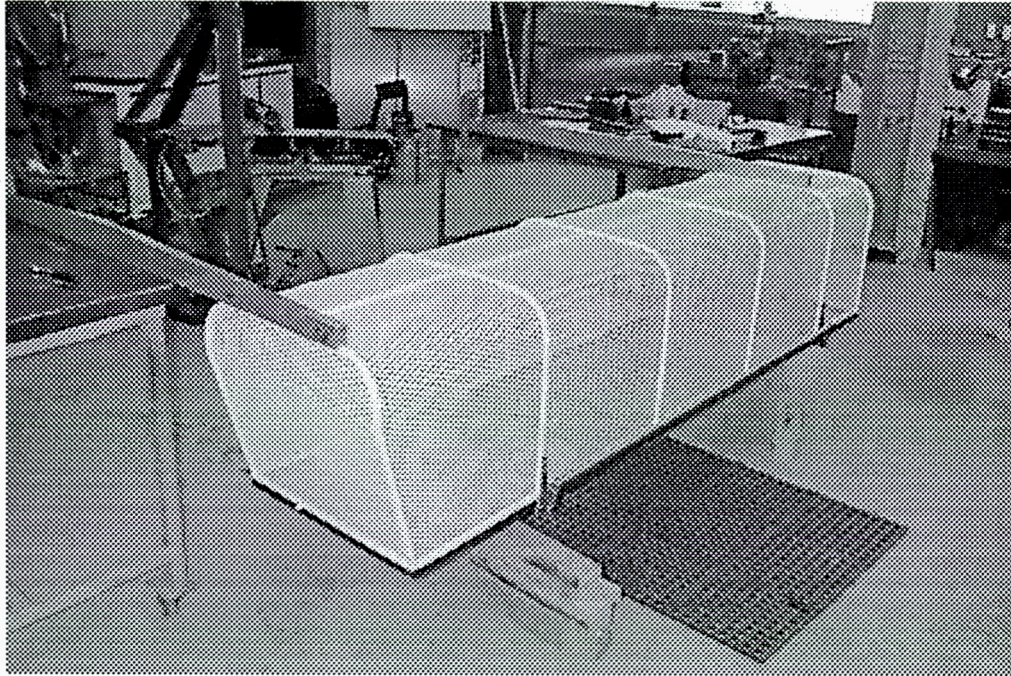


Figure 7.5 Basket Set Upside-Down With 12 Bags of Lead Shot on Lid
Total Load on Lid is 300 lb.

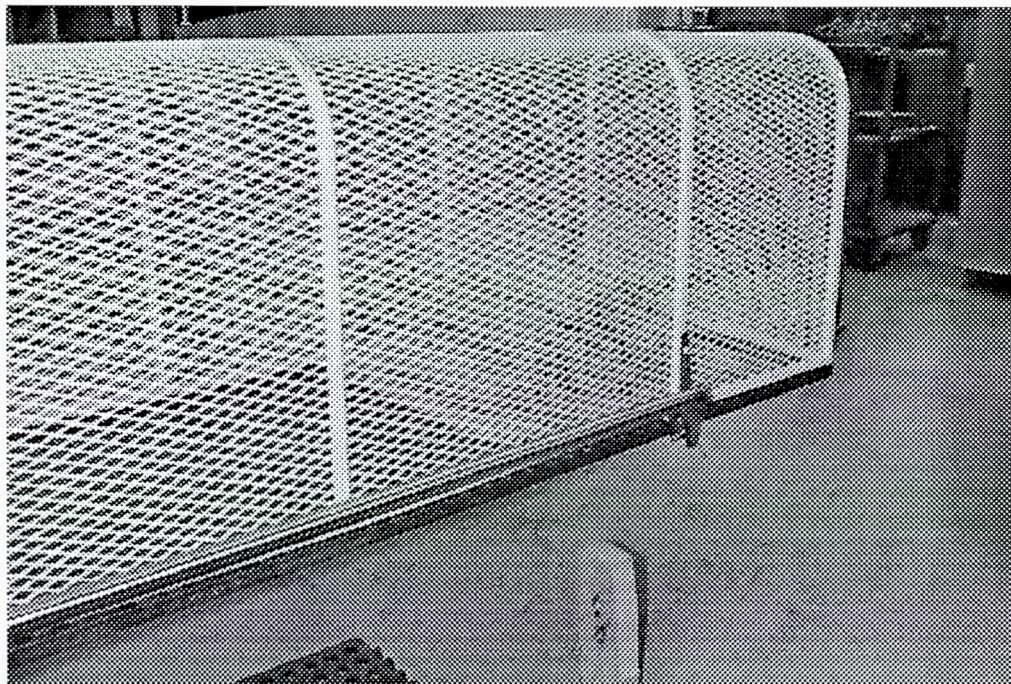


Figure 7.6 Six Bags of Lead Shot Per Clamp = 150 Pounds
Required Ultimate Upward Load Per Clamp = 150 Pounds

Margin of Safety = Positive

7.4 Forward Emergency Landing Load Test

The front face of the basket is covered in wire mesh, which will be shown to resist the ultimate forward emergency landing load without failure.

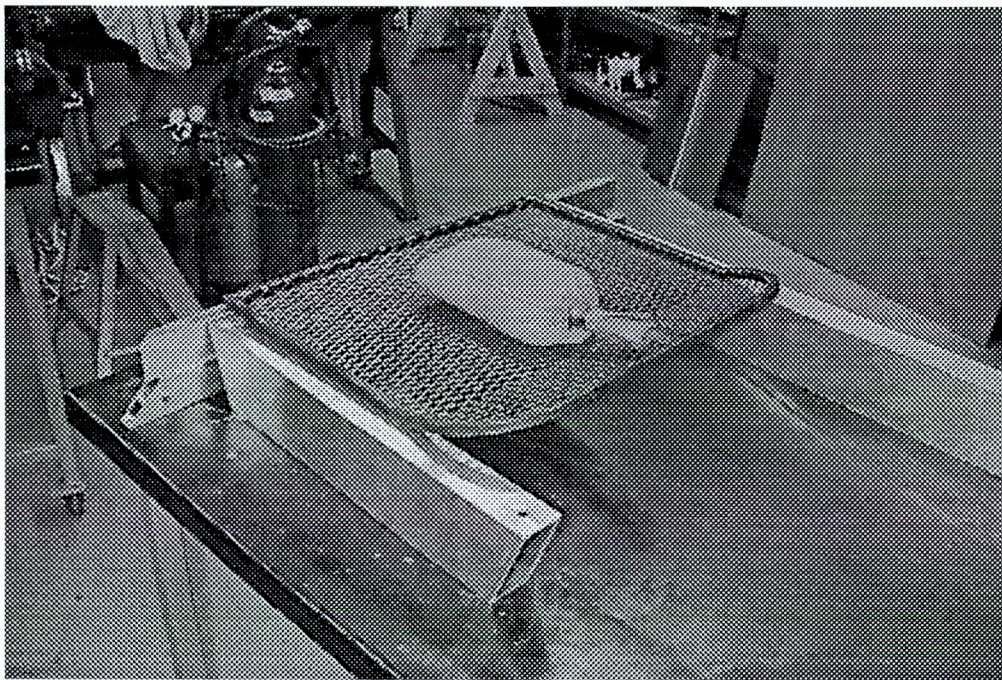


Figure 7.7 Load Test Set-Up

To perform the test, a single front frame was covered in mesh, and set up on blocks above a table. Three sides of the frame were supported on tubing stacked 4" high; the mesh was not supported by the tubing. Only 3 sides were supported in the test, as the top of the basket is open. This set up is shown in Figure 7.7. Bags of lead shot were piled on top of the frame (Figure 7.8) to apply the forward emergency landing load. An aluminum plate (weighing 25 pounds) was placed on the pile after the 20th bag to stabilize the pile.

During the test, it was observed that the tubes supporting the frame were tilting inward. To prevent them from collapsing, angle irons were clamped to the table, butting against the tubes to keep the bottoms from sliding outward. This can be seen in Figure 7.8.



Figure 7.8 Sixty Bags of Lead Shot and the Aluminum Plate on the Mesh

Not all of the bags contained 25 pounds of lead shot. Each bag was weighed before it was placed on the pile, and, as a double check, they were weighed as they were taken off. The sum of the weights of the bags of lead shot are tabulated in Table 7.9

ADDED					REMOVED				
20	25	pound	bags	500	12	25	pound	bags	300
1	25	pound	plate	25	1	27	pound	bag	27
13	25	pound	bags	325	1	29	pound	bag	29
1	31	pound	bag	31	1	35	pound	bag	35
1	37	pound	bag	37	1	27	pound	bag	27
1	30	pound	bag	30	1	25	pound	bag	25
1	31	pound	bag	31	1	25	pound	bag	25
1	29	pound	bag	29	1	26	pound	bag	26
1	26	pound	bag	26	1	38	pound	bag	38
1	28	pound	bag	28	1	31	pound	bag	31
1	25	pound	bag	25	1	32	pound	bag	32
1	31	pound	bag	31	1	35	pound	bag	35
1	35	pound	bag	35	1	29	pound	bag	29
1	38	pound	bag	38	1	31	pound	bag	31
1	29	pound	bag	29	1	37	pound	bag	37
1	27	pound	bag	27	1	28	pound	bag	28
1	27	pound	bag	27	1	30	pound	bag	30
1	35	pound	bag	35	12	25	pound	bags	300
12	25	pound	bags	300	1	25	pound	plate	25
					20	25	pound	bags	500
WEIGHT ADDED 1609 pounds					WEIGHT REMOVED 1610 pounds				

Table 7.9 Weight of Lead Shot Piled on Frame

The mesh in the front frame did not fail under the ultimate emergency landing load. As can be seen in Figures 7.10 and 7.11, the mesh deflected about 2 inches under 1600 pounds, and remained stretched by about 1.5" after the load had been removed.

Margin of Safety = Positive



Figure 7.10 Deflection of Mesh under 1600 Pounds = 2"



Figure 7.11 Permanent Deformation of Mesh = 1.5"

7.6 Sideward Load on Handle

The test was performed with the basket resting on its side on a table, the handle over the edge and free to open, as shown in Figure 7.12. The spring keeps the handle shut. When a second identical handle is attached to the first, the sideward load pulling the handle open is 2 times the weight of one handle. In Figure 7.13, it can be seen that the handle does not open under this load.

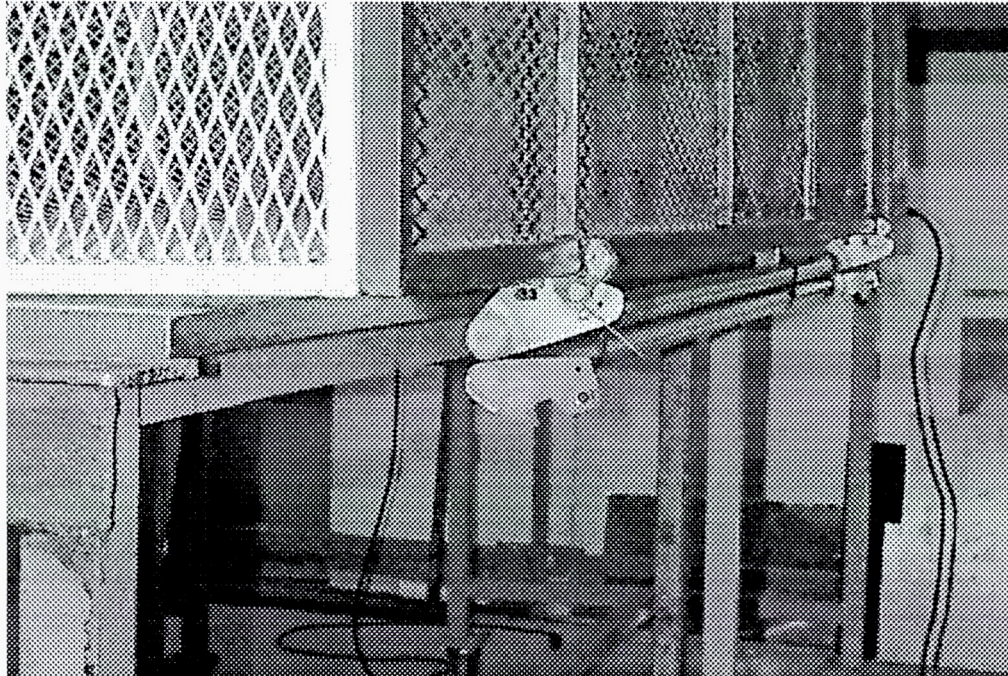


Figure 7.12 Basket Lying on its Side With Two Handles

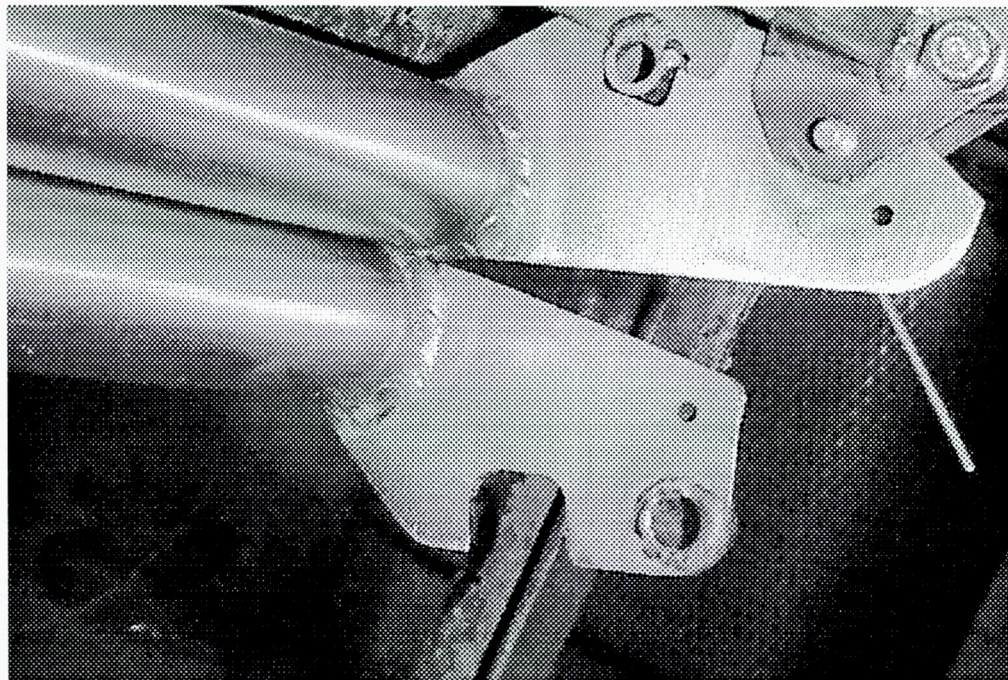


Figure 7.13 Weight of Two Handles Does Not Open Lid

Margin of Safety = Positive

AERO Design Ltd.

TEST REPORT TR362.02

EXTERNAL SIDE-MOUNTED HELI-SKI BASKET

BELL 407 HELICOPTER

Approved: E. Burgoin, P. Eng.

Date: 11 Nov., 1999

Revision: 1, 27 October, 2000
Revision 2, 4 December, 2000

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1.0 INTRODUCTION

The cargo basket installation consists of a basket assembly of welded tube and mesh construction supported and attached to the helicopter by two machined aluminum beams. The machined aluminum beams and their attachment to the helicopter are shown to be compliant with the structural regulatory requirements by analysis in AERO Design Ltd. engineering report ER362.01. The welded basket assembly is difficult to analyze numerically and is substantiated by test in this report. The scope of this report is limited to the welded basket assembly.

2.0 REFERENCE

AERO Design Ltd. drawing 36201.

3.0 BASIS OF CERTIFICATION

FAR 27 at amendment 30

4.0 PURPOSE OF TEST

The load tests are to demonstrate compliance with the following conditions:

- a) Limit and ultimate aerodynamic drag load at V_{ne} . (Less critical than b))
- b) Limit and ultimate aerodynamic drag at V_{ne} combined with limit and ultimate positive maneuvering load.
- c) Negative maneuvering load. (Lid stays closed)
- d) Emergency landing loads. (Lid stays closed, mesh does not fail)

5.0 LOADS

5.1 Maneuvering Load

Maneuvering Loads Required for Test

$$W_b := 50 \text{ lbf}$$

Weight of basket

$$W_l := 200 \text{ lbf}$$

Weight of cargo load

$$n_m := 3.5$$

Limit positive maneuvering load factor

$$n_{m_neg} := -1.0$$

Limit negative maneuvering load factor

$$n_{sf} := 1.5$$

Safety factor

Limit Maneuvering Load

$$p_m := W_l n_m + W_b (n_m - 1)$$

Limit maneuvering test load

$$p_m = 825 \text{ lbf}$$

$$p_{m_neg} := W_l n_{m_neg}$$

Limit negative maneuvering test load

$$p_{m_neg} = -200 \text{ lbf}$$

Ultimate Maneuvering Load

$$p_{m_ult} := W_l (n_m n_{sf}) + W_b [(n_m n_{sf}) - 1]$$

Ultimate maneuvering test load

$$p_{m_ult} = 1263 \text{ lbf}$$

$$p_{m_neg_ult} := p_{m_neg} n_{sf}$$

Ultimate negative maneuvering test load

$$p_{m_neg_ult} = -300 \text{ lbf}$$

5.2 Aerodynamic Drag Load

To determine a satisfactory coefficient of drag on the basket, "Fluid Dynamic Drag", by Hoerner, was used. Figures 21 and 22 from Chapter 3 are coefficient of drag curves for round and square bodies. The basket has a fineness ratio of approximately 4.5, and its front surface is neither square nor round, nor is it perpendicular to the airflow. Both figures give $C_{do} \sim 0.8 - 0.9$, therefore it can be assumed that the differing assumptions in the two tables have negligible effects and that the drag on the basket will not be greater than 1.0. A drag coefficient of $C_d = 1.5$ will be used to make the analysis of the basket conservative.

$C_d := 1.5$ Coefficient of Drag, conservatively overestimated

$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$ Density of air at sea level

$V_{ne} := 140 \text{ knots}$ Never Exceed Speed of the Bell 407

$n_{sf} := 1.5$ Safety Factor, Ref. 27.303

$w_{\text{basket}} := 22.0 \text{ in}$ Width of the basket face

$h_{\text{basket}} := 21.0 \text{ in}$ Height of the basket face

$S_{\text{basket}} := w_{\text{basket}} \cdot h_{\text{basket}}$

$S_{\text{basket}} = 3.21 \cdot \text{ft}^2$ Surface Area of the basket face.

$V_d := \frac{V_{ne}}{0.9}$

$V_d = 179 \cdot \text{mph}$ Design Speed of the Bell 407, Ref. FAR 27.1505

$D_{\text{basket}} := \frac{1}{2} \cdot \rho \cdot V_d^2 \cdot S_{\text{basket}} \cdot C_d$

$D_{\text{basket}} = 394.4 \cdot \text{lbf}$ Aerodynamic Drag on basket face at V_d

$P_{\text{ult_drag_vne_basket}} := D_{\text{basket}} \cdot n_{sf}$

$P_{\text{ult_drag_vne_basket}} = 591.7 \cdot \text{lbf}$ Ultimate Drag load on basket face at V_d

5.3 Forward Emergency Landing Load

In an emergency landing, the contents of the basket may be forced forward at up to 8 g's.

$$W_{\text{cargo}} := 200 \text{ lbf}$$

Maximum weight of cargo.

$$n_{\text{fwd_emerg}} := 8.0$$

Ultimate forward emergency landing load fact

$$P_{\text{fwd_emerg}} := W_{\text{cargo}} \cdot n_{\text{fwd_emerg}}$$

$$P_{\text{fwd_emerg}} = 1600 \text{ lbf}$$

Ultimate forward emergency landing load

The cargo in the basket can be expected to shift forward and press upon the mesh of the front face. Failure of the front mesh could allow the cargo to slide forward and block the pilot's door, preventing him from escaping. The mesh can be bent outward permanently by the load. This is acceptable, because it will not interfere with the opening of the door, which swings away from the basket.

5.4 Sideward Emergency Landing Load

The occupants of the helicopter are not put into jeopardy by objects escaping outward from the basket during an emergency landing. There is a hazard from objects escaping from the basket in flight and entering the tail rotor of the helicopter. To prevent this event, the handle will be shown to remain closed and locked when it is subjected to a 2g sideward load.

5.5 Upward Emergency Landing Load

Since the occupants of the helicopter are not put into jeopardy by objects escaping upward from the basket during an emergency landing, this load condition is not critical.

6.0 TEST SET-UP

The basket assembly was supported on a workshop table, with square members under the two basket frames that attach the basket to the machined aluminum support beams. A $\frac{1}{4}$ " thick piece of flat iron was clamped to the one square member at the end of the basket to prevent movement of the basket in a longitudinal direction by contact with the basket frame normally attached to a machined aluminum beam. The basket assembly was held in place only by gravity and the piece of $\frac{1}{4}$ " flat iron and no bolting was used.

The aerodynamic drag was simulated by applying a load from a come-along through a dynamometer using a chain around the basket. The load was applied along the longitudinal axis of the basket and resisted by the piece of $\frac{1}{4}$ " flat across the end frame of the basket. This resulted in all of the drag load being resisted by one frame, which is conservative since the drag load in the actual helicopter installation is divided between two frames. The chain applied load to one end of the basket through a $\frac{1}{2}$ " thick aluminum plate, that was used to distribute the load over the entire end of the basket and prevent damage to the mesh material due to concentrated loads, but which otherwise played no other role in support of the basket. The load was applied slightly above the centre line of the basket.

The maneuvering load was simulated by loading the basket assembly with sand bags and lead shot.

The maneuvering load and drag loads were applied simultaneously.

The test set-up is shown in the following photographs.



Figure 6.1 Plate Fastened to Aft Basket Face to Apply Drag Load

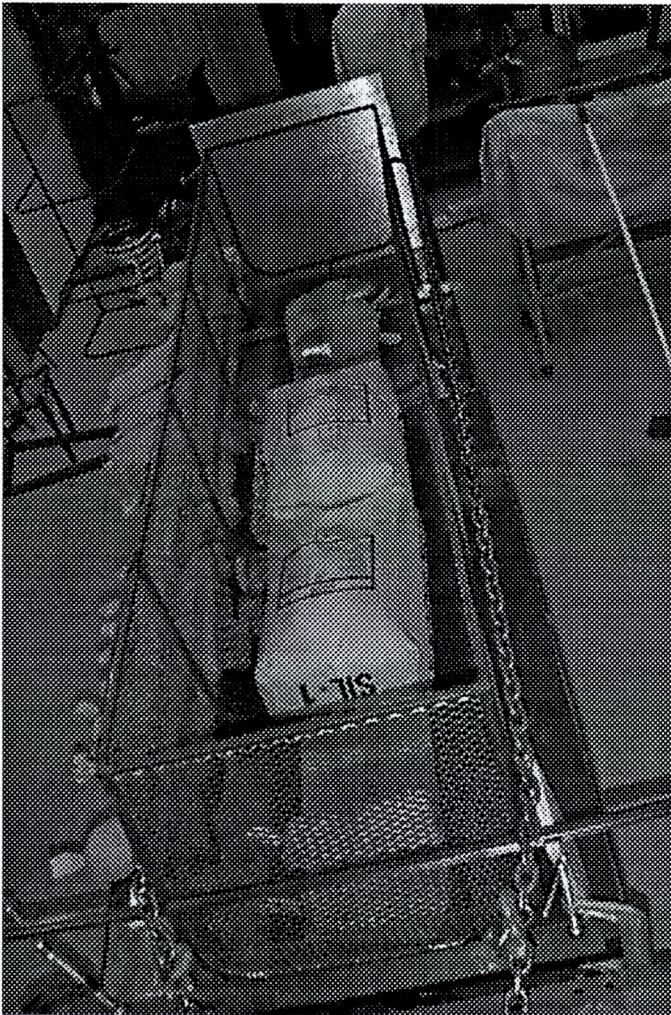


Figure 6.2
Sand Bags to Apply Manouvering
Load

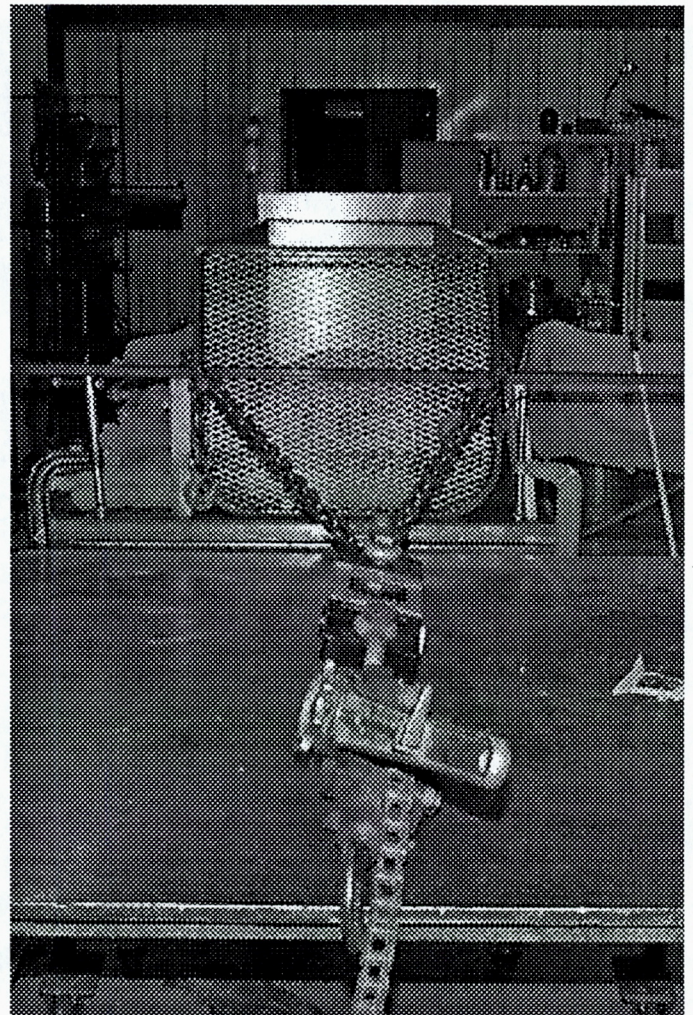


Figure 6.3
Chain And Come-Along to
Apply Drag Load

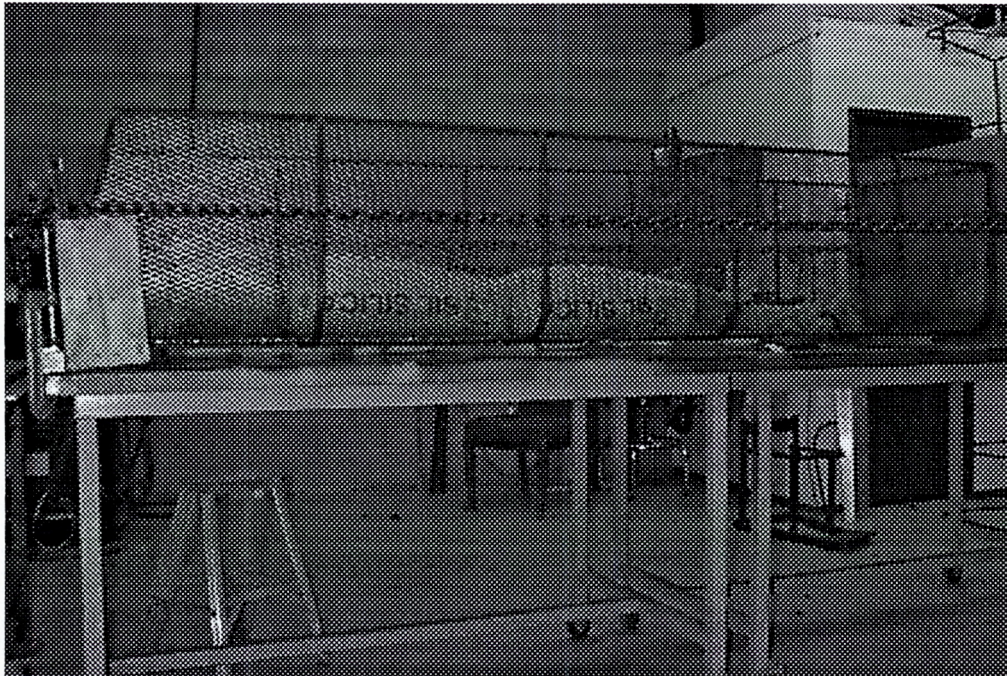


Figure 6.4 Clearance of Basket Over Table Prior to Test

7.0 LOAD TESTS

7.1 Aerodynamic Drag Limit and Ultimate Loading at V_{ne}

This load condition is less critical than the combined drag and maneuvering load condition tested in Section 7.2.

7.2 Combined Drag at V_{ne} and Positive Maneuvering Loading

Limit Load Condition

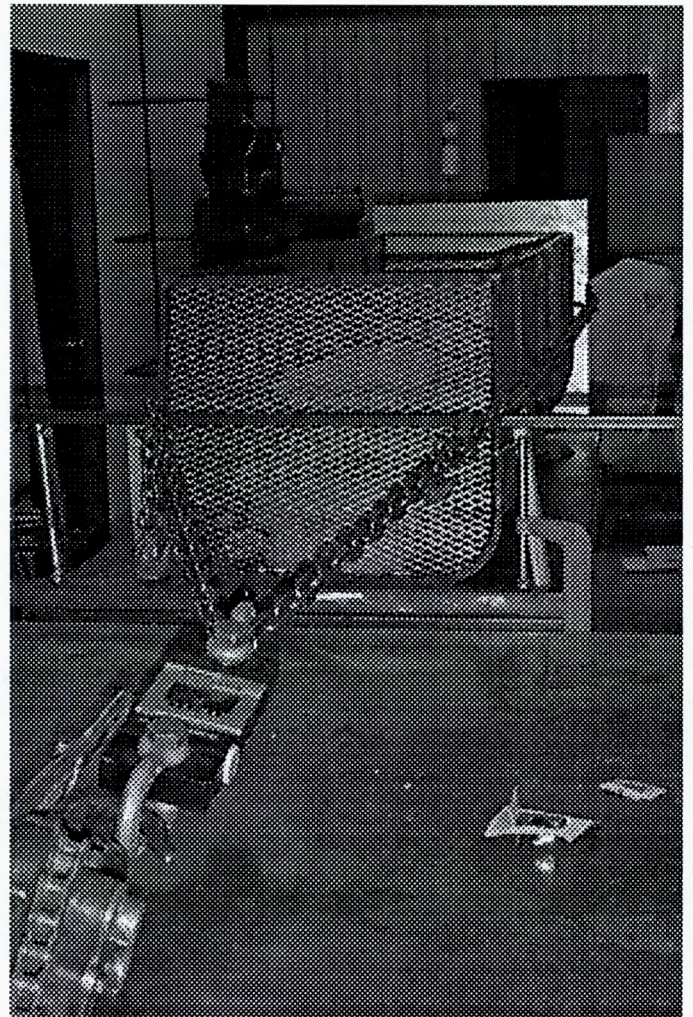
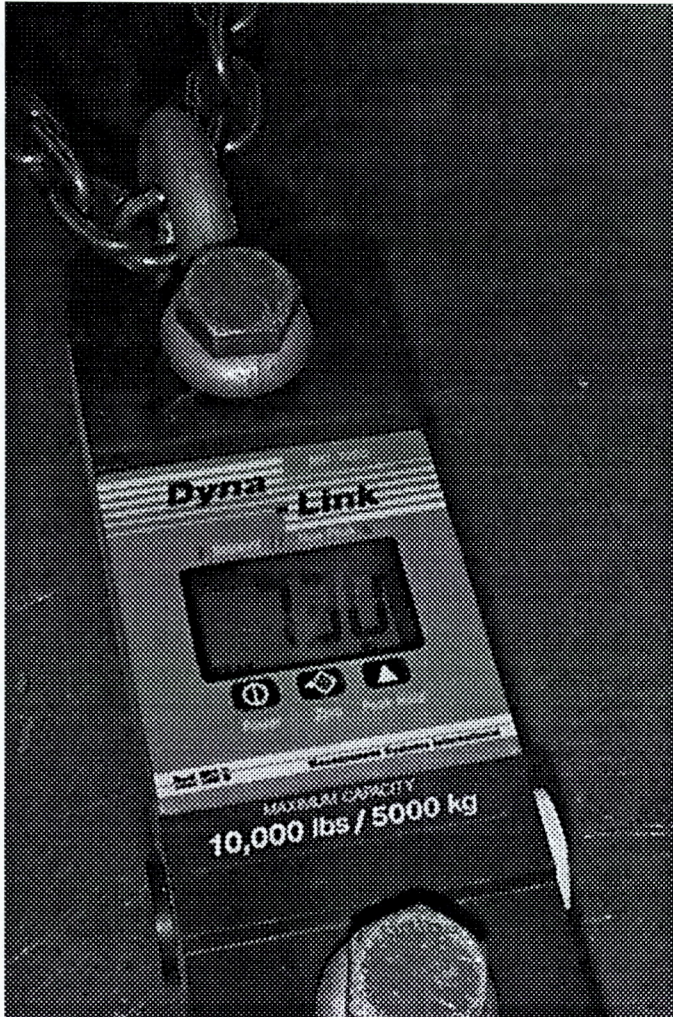
A drag load of 450 lb was applied by the come-along simultaneously with a positive maneuvering load of 850 lb. by loading the basket with sand bags and lead shot.

There were no signs of significant deflections or permanent deformation resulting from the application of these loads.

Ultimate Load Condition

An ultimate drag load of 730 lb was applied by the come-along simultaneously with an ultimate positive maneuvering load of 1276 lb. by loading the basket with sand bags (2 @ 40 kg. each) and lead shot (44 @ 25 lb. each). The load was applied for approximately 5 minutes.

The basket assembly did not fail and there were no signs of permanent deformation resulting from the application of these loads.



Figures 7.1 and 7.2 Come-Along Applying Drag Test Load = 730 Pounds

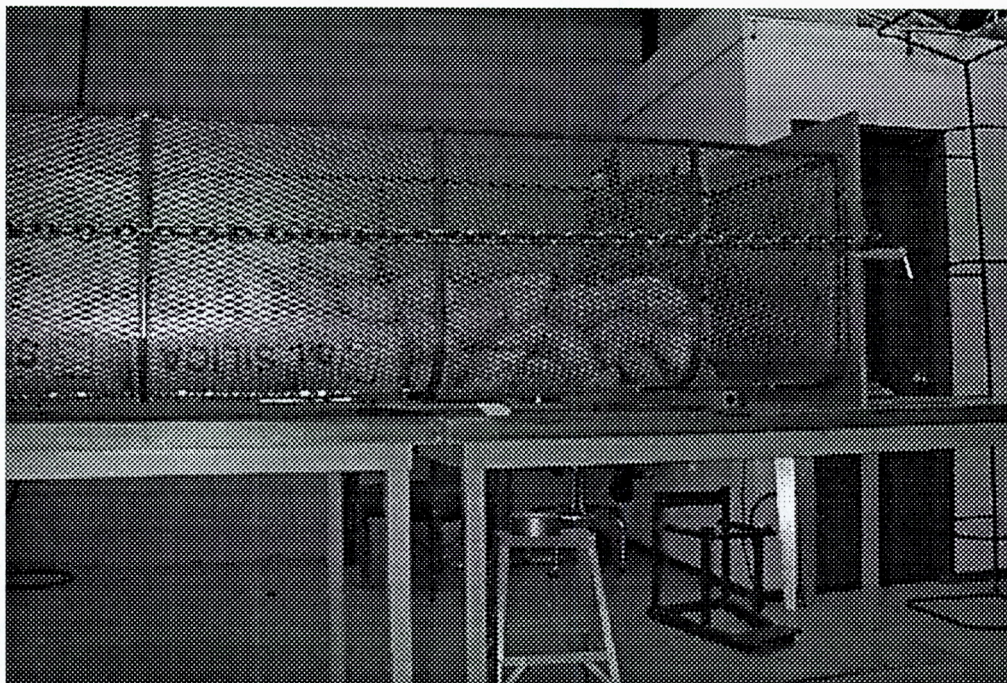
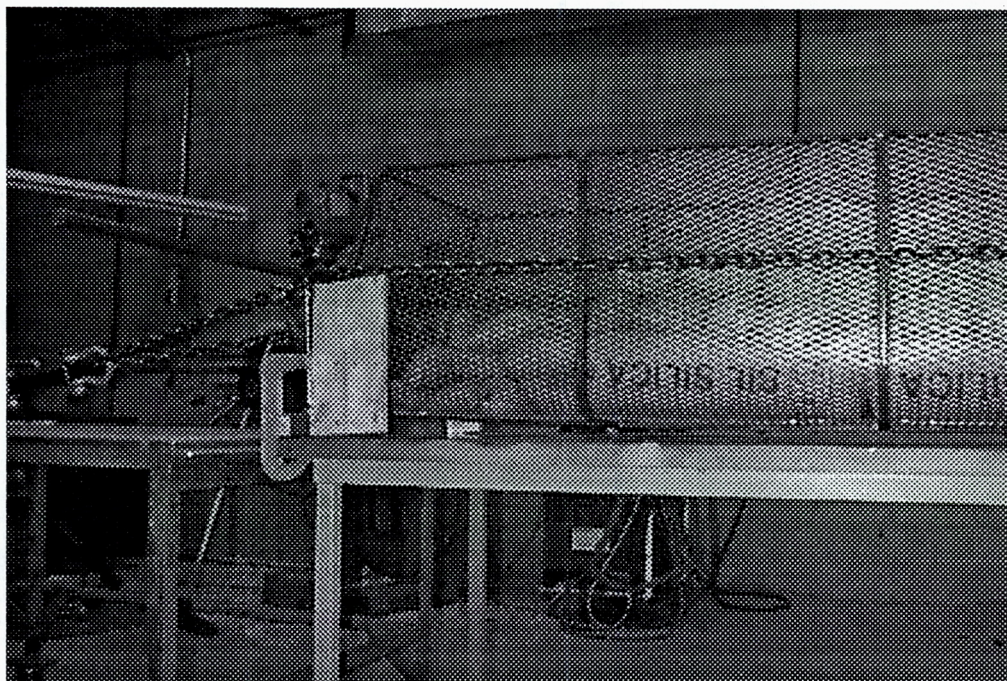


Figure 7.3 Sandbags and Lead Shot Bags Applying
Manouvering Test Load = 1276 Pounds

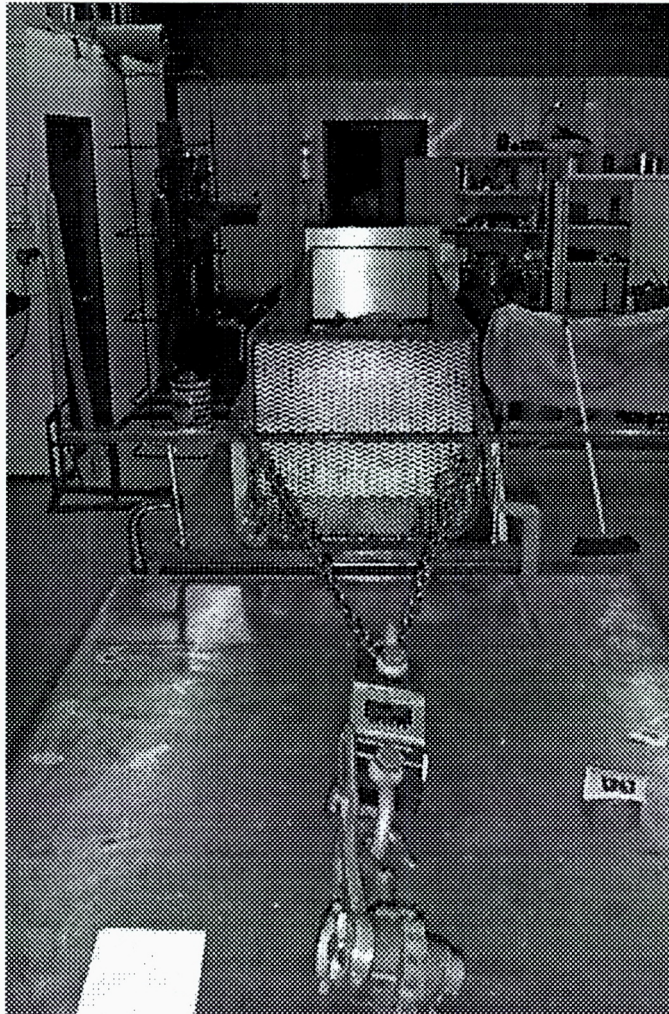


Figure 7.4 Manouvering Test Load and Aerodynamic Drag Test Load
Applied Simultaneously

Required Manouvering Load = 592 Pounds

Required Aerodynamic Drag Load = 1263 Pounds

Margin of Safety = Positive

7.3 Negative Maneuvering Load Test

The basket was supported upside-down with twelve bags of lead shot resting on the lid, 6 near each clamp, to apply the ult. neg. man. load. The lid did not fail.

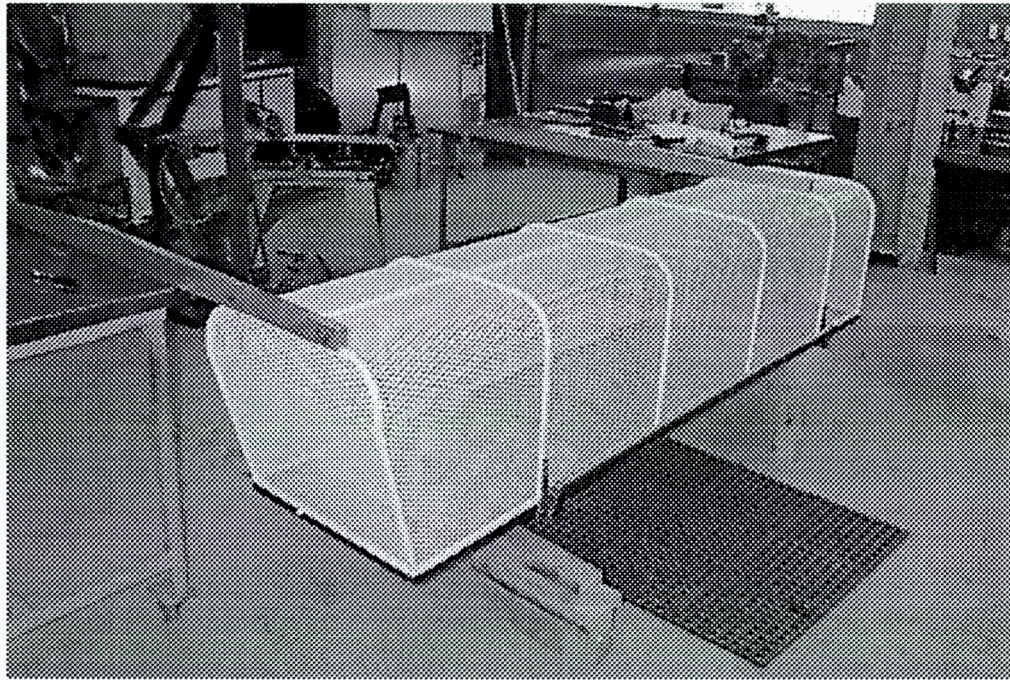


Figure 7.5 Basket Set Upside-Down With 12 Bags of Lead Shot on Lid
Total Load on Lid is 300 lb.

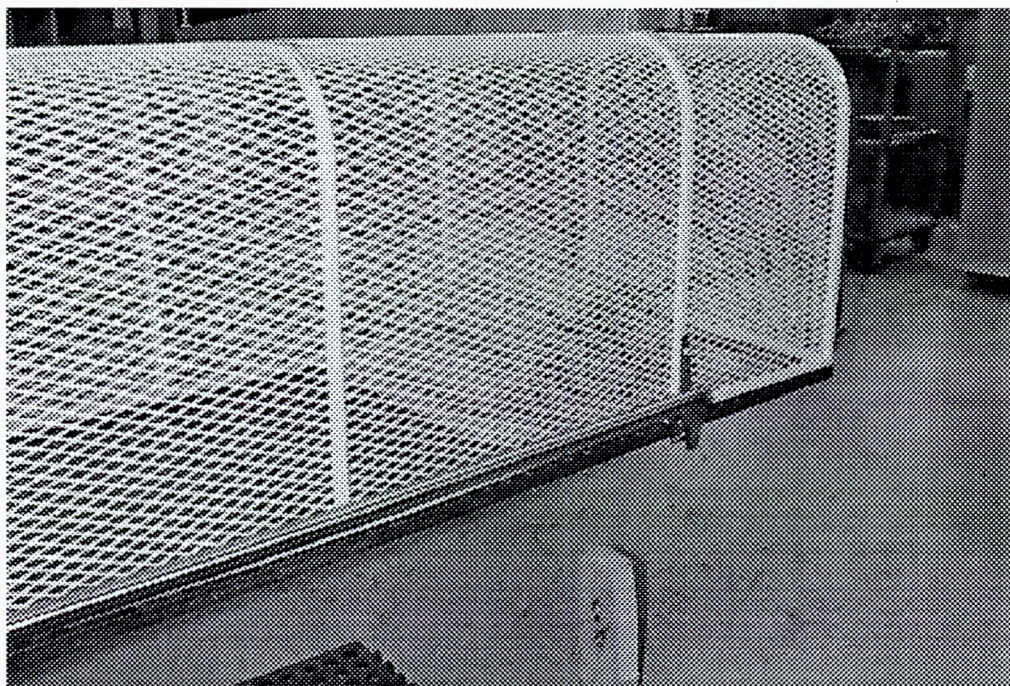


Figure 7.6 Six Bags of Lead Shot Per Clamp = 150 Pounds
Required Ultimate Upward Load Per Clamp = 150 Pounds

Margin of Safety = Positive

7.4 Forward Emergency Landing Load Test

The front face of the basket is covered in wire mesh, which will be shown to resist the ultimate forward emergency landing load without failure.

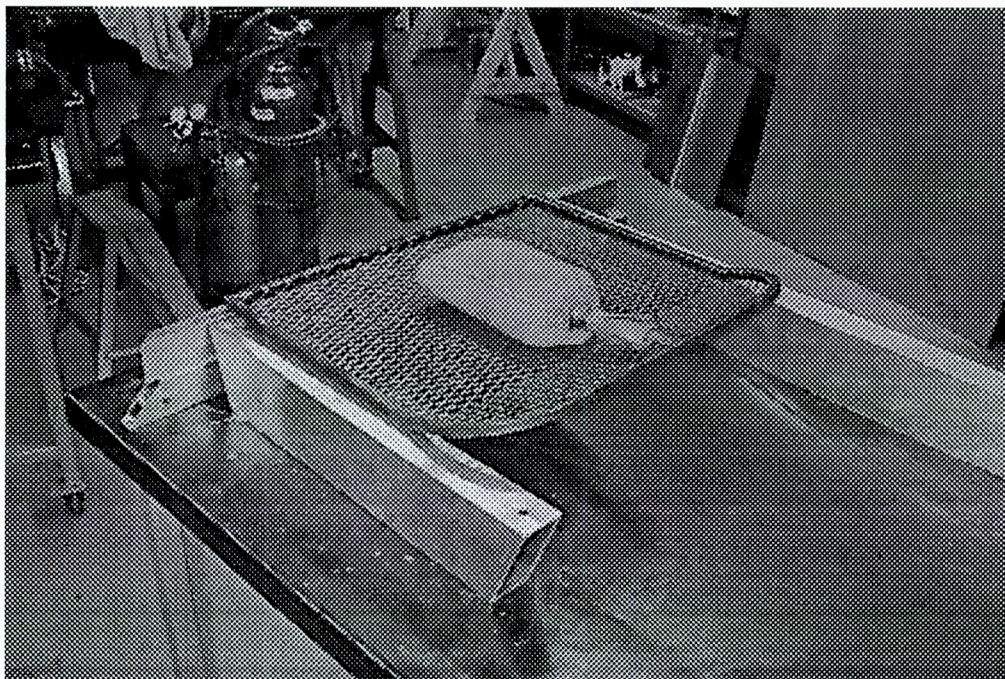


Figure 7.7 Load Test Set-Up

To perform the test, a single front frame was covered in mesh, and set up on blocks above a table. Three sides of the frame were supported on tubing stacked 4" high; the mesh was not supported by the tubing. Only 3 sides were supported in the test, as the top of the basket is open. This set up is shown in Figure 7.7. Bags of lead shot were piled on top of the frame (Figure 7.8) to apply the forward emergency landing load. An aluminum plate (weighing 25 pounds) was placed on the pile after the 20th bag to stabilize the pile.

During the test, it was observed that the tubes supporting the frame were tilting inward. To prevent them from collapsing, angle irons were clamped to the table, butting against the tubes to keep the bottoms from sliding outward. This can be seen in Figure 7.8.



Figure 7.8 Sixty Bags of Lead Shot and the Aluminum Plate on the Mesh

Not all of the bags contained 25 pounds of lead shot. Each bag was weighed before it was placed on the pile, and, as a double check, they were weighed as they were taken off. The sum of the weights of the bags of lead shot are tabulated in Table 7.9

ADDED					REMOVED				
20	25	pound	bags	500	12	25	pound	bags	300
1	25	pound	plate	25	1	27	pound	bag	27
13	25	pound	bags	325	1	29	pound	bag	29
1	31	pound	bag	31	1	35	pound	bag	35
1	37	pound	bag	37	1	27	pound	bag	27
1	30	pound	bag	30	1	25	pound	bag	25
1	31	pound	bag	31	1	25	pound	bag	25
1	29	pound	bag	29	1	26	pound	bag	26
1	26	pound	bag	26	1	38	pound	bag	38
1	28	pound	bag	28	1	31	pound	bag	31
1	25	pound	bag	25	1	32	pound	bag	32
1	31	pound	bag	31	1	35	pound	bag	35
1	35	pound	bag	35	1	29	pound	bag	29
1	38	pound	bag	38	1	31	pound	bag	31
1	29	pound	bag	29	1	37	pound	bag	37
1	27	pound	bag	27	1	28	pound	bag	28
1	27	pound	bag	27	1	30	pound	bag	30
1	35	pound	bag	35	12	25	pound	bags	300
12	25	pound	bags	300	1	25	pound	plate	25
					20	25	pound	bags	500
WEIGHT ADDED 1609 pounds					WEIGHT REMOVED 1610 pounds				

Table 7.9 Weight of Lead Shot Piled on Frame

The mesh in the front frame did not fail under the ultimate emergency landing load. As can be seen in Figures 7.10 and 7.11, the mesh deflected about 2 inches under 1600 pounds, and remained stretched by about 1.5" after the load had been removed.

Margin of Safety = Positive



Figure 7.10 Deflection of Mesh under 1600 Pounds = 2"

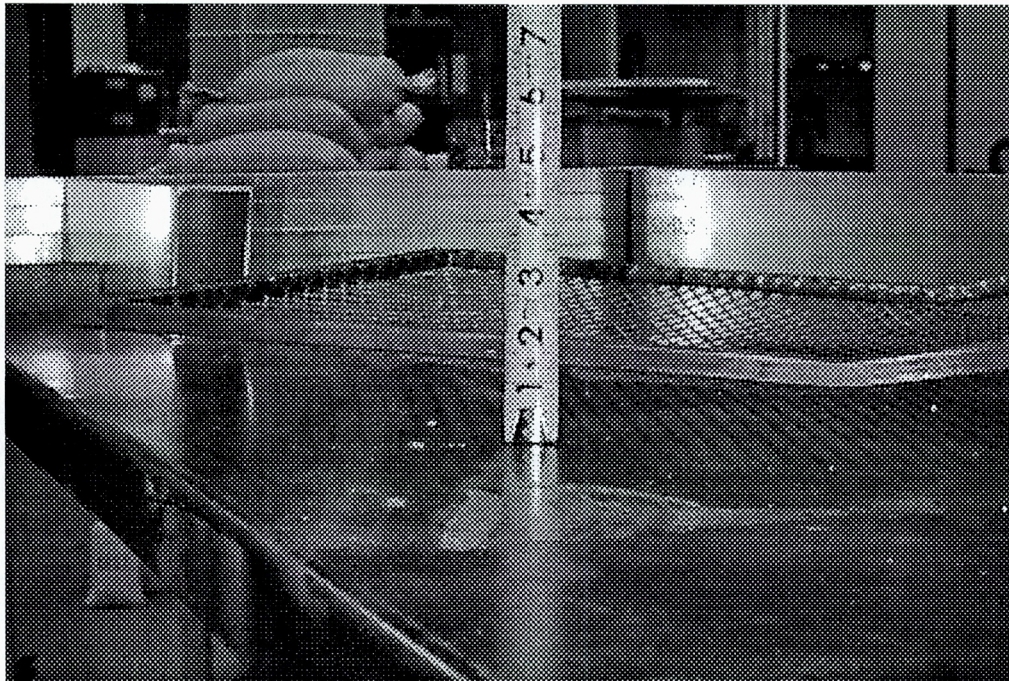


Figure 7.11 Permanent Deformation of Mesh = 1.5"

7.6 Sideward Load on Handle

The test was performed with the basket resting on its side on a table, the handle over the edge and free to open, as shown in Figure 7.12. The spring keeps the handle shut. When a second identical handle is attached to the first, the sideward load pulling the handle open is 2 times the weight of one handle. In Figure 7.13, it can be seen that the handle does not open under this load.

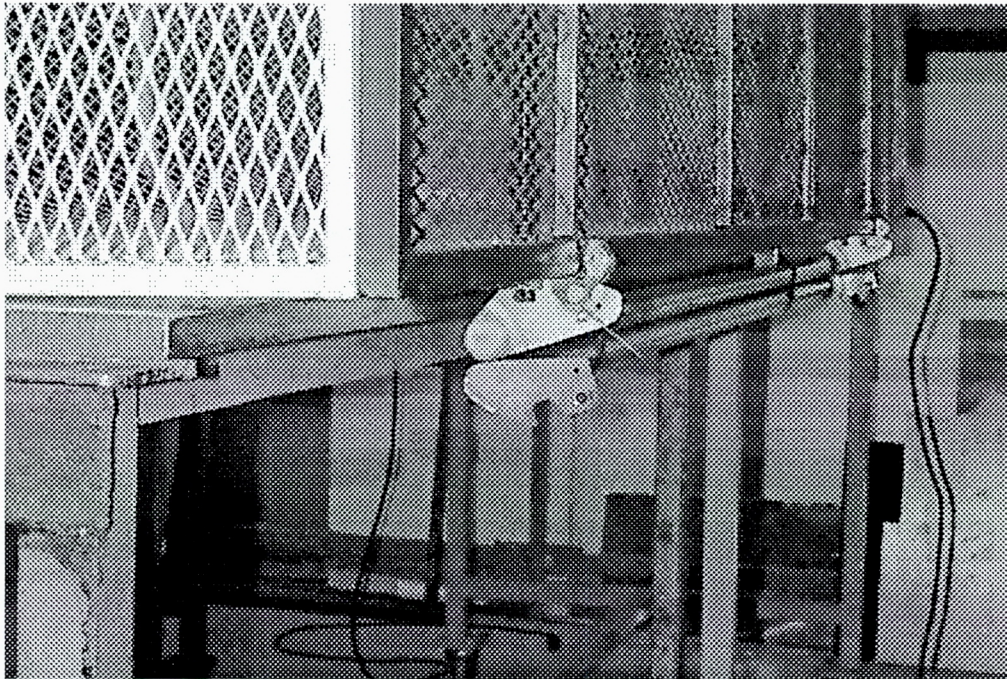


Figure 7.12 Basket Lying on its Side With Two Handles

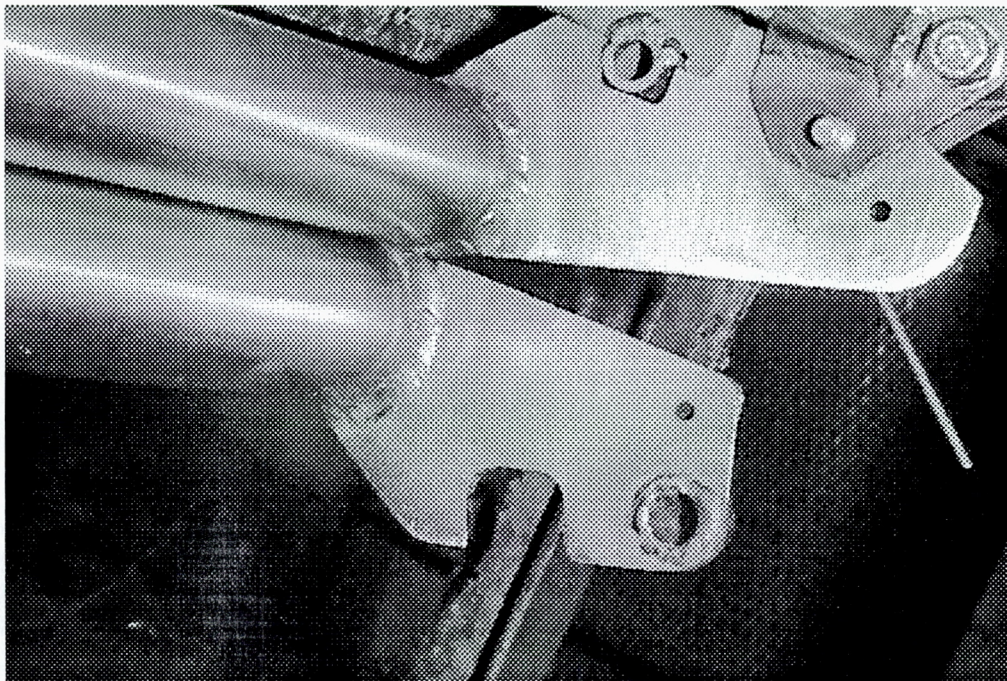


Figure 7.13 Weight of Two Handles Does Not Open Lid

Margin of Safety = Positive

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Material: Aluminum - 6061	Thickness (inch): 1	
Desc: Plates #49221-01 Forward Mounting beam		Qty: 3
Material: Aluminum - 6061	Thickness (inch): 1	

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Quality checked by: Karam

Desc: Plates #49221-02 AFT Mounting beam	Qty: 1
Material: Aluminum - 6061	Thickness (inch): 1
Desc: Plates #49221-01 Forward Mounting beam	Qty: 1
Material: Aluminum - 6061	Thickness (inch): 1

USE FOR LOAD TEST

CRITICAL ULTIMATE LOAD FACTORS:

Downward:	Ultimate Positive Manoeuvring Load Factor:	$n_{man_ult} = 5.25$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{e_fwd} = 4.00$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{e_side} = 2.00$
Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{e_up} = 1.50$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.2 Inertia Loads

TEST LOADS ON BASKET

Weight of basket.	$W_{basket} := 55 \text{ lbf}$
Cargo Capacity of basket.	$W_{cargo} := 200 \text{ lbf}$
Fitting Factor (Not required where compliance is shown by test)	$n_{ff} := 1.15$

DOWNWARD:

The basket shall support its contents under the maximum manoeuvring load factor.

	Ultimate Positive Manoeuvring Load Factor:	$n_{man_ult} = 5.25$
$P_{z_ult} := (W_{basket} + W_{cargo}) \cdot n_{man_ult}$	Ultimate Vertical Load on basket.	$P_{z_ult} = 1339 \text{ lbf}$

FORWARD:

Deflection of the basket, or shifting of its contents in the forward direction in an emergency landing does not endanger the occupants of the helicopter.

Ultimate Forward Emergency Landing Load Factor: N/A

5.3 Drag Loads

	Length of basket.	$l_{\text{basket}} := 74 \text{ in}$
	Width of basket.	$w_{\text{basket}} := 22 \text{ in}$
	Height of basket.	$h_{\text{basket}} := 16 \text{ in}$
$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$	Frontal Area of basket.	$A_f = 2.44 \text{ ft}^2$
$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$	Planar Area of basket.	$A_p = 11.3 \text{ ft}^2$
	Fineness ratio of basket	$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.4$
	Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Figure 22).	$C_{Do} := 1.6$
	Density of air at Sea Level.	$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$
	Never-Exceed-Speed of 206L-4. (Ref. 206L-4 Flight Manual.)	$V_{ne} := 126.5 \text{ knots}$
$V_d := \frac{V_{ne}}{0.9}$	Dive Speed of Bell 206L-4	$V_d = 141 \text{ knots}$
$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$	Drag on basket.	$\text{Drag} = 262 \text{ lbf}$
$P_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$	Ultimate applied Drag load on basket.	$P_{\text{drag_ult}} = 451 \text{ lbf}$
$P_{\text{drag_test}} := \text{Drag} \cdot n_{sf}$	Ultimate Drag load on basket in Static Test.	$P_{\text{drag_test}} = 393 \text{ lbf}$

rounded or streamlined head forms (lower part) — as a function of the fineness ratio l/d .

Parallel-Sided Shapes. Plotted in figure 21 are the drag coefficients of a number of cylindrical bodies in axial flow. Figure 22 shows corresponding results in two-dimensional flow. The drag of these shapes essentially consists of that of the forebody and the base drag originating at the blunt rear end. At zero length ratio, the coefficients of disk and plate are plotted, respectively. Two branches are seen in each graph, one for blunt head form or leading edge, respectively; and the other one representing the experimental results of rounded or streamline shapes.

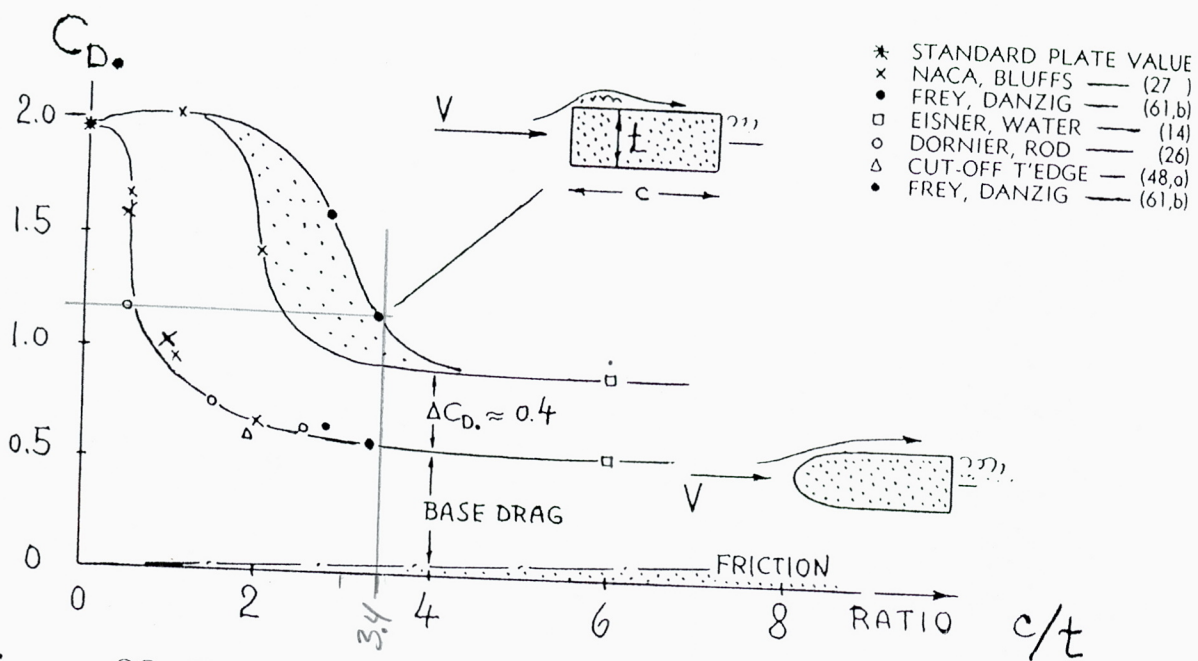
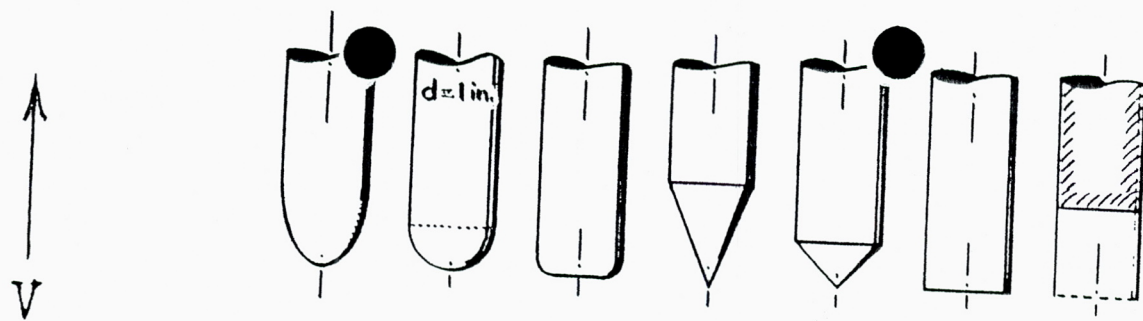


Figure 22. Drag coefficient of "rectangular" sections (tested between walls) with blunt leading edge (upper part) and with rounded shape (lower part), against length ratio.



$C_{D0.} = -.05 \quad .01 \quad 0.2 \quad 0.2 \quad 0.4 \quad 0.8 \quad 1.0$

Figure 20. Coefficients indicating the forebody-pressure drag of a series of cylindrical bodies, evaluated from pressure distribution (25,e).

coefficient close to zero. As flow separation starts and grows in the less streamlined and bluffer shapes, the drag coefficient grows rapidly, however.

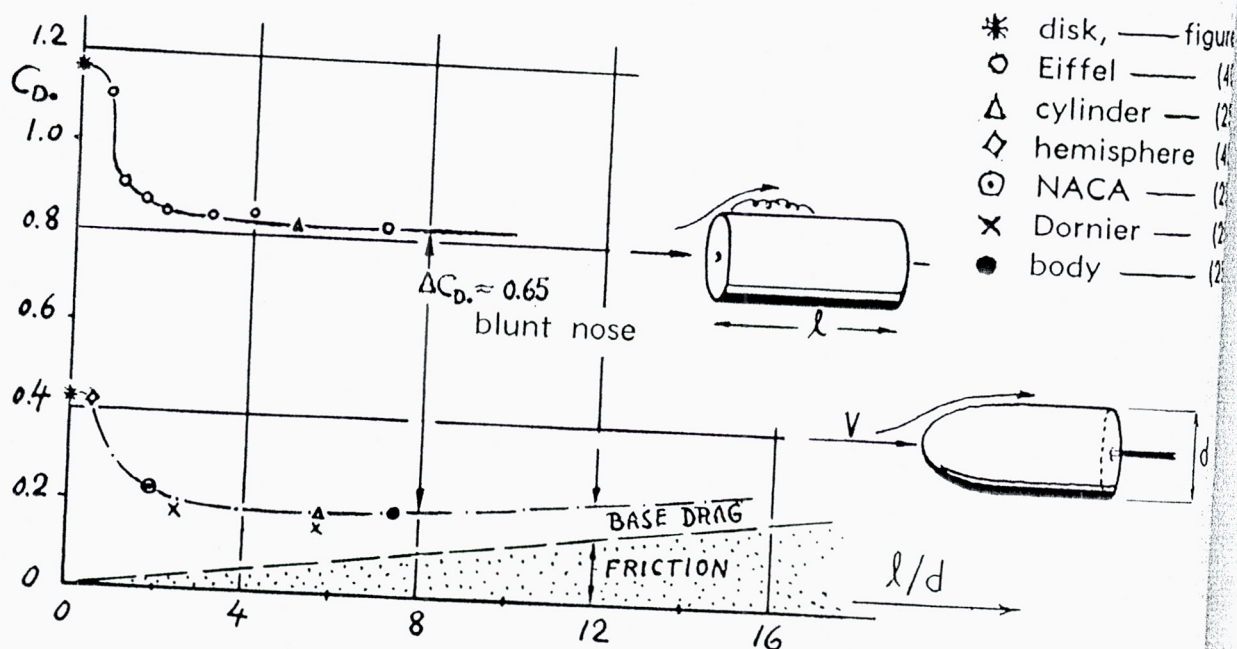


Figure 21. Drag coefficients of cylindrical bodies in axial flow, with blunt shape (in the upper part) and with rounded or streamlined head forms (lower part)—as a function of the fineness ratio l/d .

Parallel-Sided Shapes. Plotted in figure 21 are

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a) Riabouchi
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To check on status of your order please call Lori Lee @ (403) 250-2576

Submitted by: 

Graham Park

Steven Sakay

F: 403-250-8333

*Aero Design**ALB.*

COD
W003718 ASA ALLOYS INC
81 STEINWAY BLVD
ETOBICOKE ON

CARD NUMBER 4512110024772121
EXPIRY DATE 1003
CARD TYPE VISA
DATE/TIME 02/04/09 08:19
M98139942-660-002

PURCHASE \$464.38

APPROVED - THANK YOU
000753

* SIGNATURE *SSAF*

Please sign + fax back to 416-213-9645.

Thank You.
Linda Signard
Credit Mgr.

Steven Fahey

F: 403-250-8333

*Aero Design**ALB.**CoD**#W003718*ASA ALLOYS INC
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SIGNATURE

*S Fahey**Please sign + fax back to 416-213-9645.**Thank You.**Linda Dignard
Credit Mgr.*



FACSIMILE COVERSHEET

FROM: John Sulderitsch
FAX #: (780) 485-1584

No. of pages: 1

DATE: 4-8-02.

TO: AERO DESIGN
ATTN: STEVEN
FAX# 280-8333

ORDERED
PAID ON
STEVE'S VISA
CARD

QUOTATION:

We are pleased to quote on the following:

TUBING

20 FT - 7/16 ϕ x .065 w k 316/316L Smcs
x 20 FT RL
@ 12.20 FT \$244.00

20 FT - 5/16 ϕ x .065 w k 304L Smcs
x 20 FT RL
@ 9.50 FT \$190.00

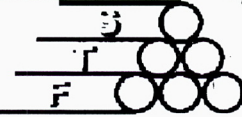
F.O.B. Your Shop
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PRICE BASED ON Full Inquiry
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STAINLESS • NICKEL • ALUMINUM

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John S.

Southern TUBE & FITTING



AERO DESIGN
CALGARY, AB

ATTN: STEVEN

PHONE: 250-8027

FAX: 250-8333

SEAMLESS STAINLESS STEEL TUBING, COLD
DRAWN TO ASTM A269/A213 AVG WALL, EDDY
CURRENT OR HYDRO TESTED

20.00	7/16" O.D. X .065 WALL T316/L SMLS 20 FOOT	\$15.2500/FT	\$305.00
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SEAMLESS STAINLESS TUBING, COLD WORKED,
BRIGHT ANNEALED, AW ASTM A269/A213, EDDY
OR HYDRO TESTED, MAXIMUM HARDNESS RB80

20.00	5/16" O.D. X .065 WALL T316/L SMLS 20 FOOT	\$8.4200/FT	\$168.40
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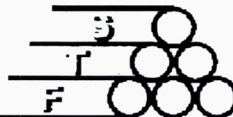
FOB: ST&F WAREHOUSE
DEL: 3-4 DAYS COMPLETE ARO
RESTOCKING POLICY APPLIES
GST/PST (TAXES) NOT INCLUDED
NET 30 DAYS FROM INVOICE DATE

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WARREN HANSEN

NOT ORDERED

#1, 7408 - 40 Street S.E., Calgary, Alberta, Canada T2C 2L6
Telephone (403) 236-2216 • Fax (403) 236-7458
E-mail: service@stube.com

Southern TUBE & FITTING



TITLE : PRICE QUOTATION

TO : STEVEN
MISCELLANEOUS SALES

FROM : WARREN HANSEN
SOUTHERN TUBE AND FITTING
PH: (403)236-2216

COMMENT:

DATE : 04/08/02
TIME : 10:15:26
PAGES : 002

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FLAT PLATE
DRAG

BELL 206L HELICOPTER LOAD FACTORS, FAR 27:

FAR 27.561(b)(3)

- i) Ultimate Upward Emergency Landing Load Factor: $n_{up} := 1.5$
- ii) Ultimate Forward Emergency Landing Load Factor: $n_{fwd} := 4.0$
- iii) Ultimate Sideward Emergency Landing Load Factor: $n_{side} := 2.0$
- iv) Ultimate Downward Emergency Landing Load Factor: $n_{down} := 4.0$

FAR 27.625

Fitting Factor:

$n_{ff} := 1.15$

FAR 27.303

Safety Factor:

$n_{sf} := 1.5$

FAR 27.337(a)

Limit Positive Manouvering Load Factor:

$n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$

Ultimate Positive Manouvering Load Factor:

$n_{man_ult} = 5.25$

Limit Negative Manouvering Load Factor:

$n_{man_n} := 1.0$

$n_{man_neg_u} := n_{man_n} \cdot n_{sf}$

Ultimate Negative Manouvering Load Factor:

$n_{man_neg_u} = 1.50$

CRITICAL ULTIMATE LOAD FACTORS:

Upward:	Ultimate Upward Emergency Landing Load Factor:	$n_{up} := 1.5$
Forward:	Ultimate Forward Emergency Landing Load Factor:	$n_{fwd} := 4.0$
Sideward:	Ultimate Sideward Emergency Landing Load Factor:	$n_{side} := 2.0$
Downward:	Ultimate Positive Manouvering Load Factor:	$n_{man_ult} = 5.25$

BEAM GEOMETRY:

FRONT BEAM:

Overall length of forward beam.	$L_{\text{fwd_beam}} := 63.80 \cdot \text{in}$
Width of beam.	$w := 1.0 \cdot \text{in}$
Spacing of gear mounting bolts (C to D).	$L_{\text{fwd}_1} := 22.00 \cdot \text{in}$
Spacing of basket mounting bolts (A to B).	$L_{\text{fwd}_2} := 14.20 \cdot \text{in}$
Spacing of basket to gear bolts (B to C).	$L_{\text{fwd}_3} := 26.60 \cdot \text{in}$
Depth of beam at bolt "A".	$h_{\text{fwd}_a} := 1.0 \cdot \text{in}$
Depth of beam at bolt "B".	$h_{\text{fwd}_b} := 2.21 \cdot \text{in}$
Depth of beam at bolt "C".	$h_{\text{fwd}_c} := 3.0 \cdot \text{in}$
Depth of beam at bolt "D".	$h_{\text{fwd}_d} := 1.25 \cdot \text{in}$

AFT BEAM:

Overall length of aft beam.	$L_{\text{aft_beam}} := 60.75 \cdot \text{in}$
Width of beam.	$w := 1.0 \cdot \text{in}$
Spacing of gear mounting bolts (C to D).	$L_{\text{aft}_1} := 22.00 \cdot \text{in}$
Spacing of basket mounting bolts (A to B).	$L_{\text{aft}_2} := 17.25 \cdot \text{in}$
Spacing of basket to gear bolts (B to C).	$L_{\text{aft}_3} := 20.50 \cdot \text{in}$
Depth of beam at bolt "A".	$h_{\text{aft}_a} := 1.0 \cdot \text{in}$
Depth of beam at bolt "B".	$h_{\text{aft}_b} := 2.12 \cdot \text{in}$
Depth of beam at bolt "C".	$h_{\text{aft}_c} := 3.0 \cdot \text{in}$
Depth of beam at bolt "D".	$h_{\text{aft}_d} := 1.25 \cdot \text{in}$

ANALYSIS OF AFT BEAM LOADS:

Weight of basket.

$$W_{\text{basket}} := 50 \cdot \text{lbf}$$

Cargo Capacity of basket.

$$W_{\text{cargo}} := 200 \cdot \text{lbf}$$

Weight of aft beam.

$$W_{\text{aft_beam}} := 10 \cdot \text{lbf}$$

Weight of forward beam.

$$W_{\text{fwd_beam}} := 10 \cdot \text{lbf}$$

$$P_{\text{external}} := W_{\text{basket}} + W_{\text{cargo}} + (W_{\text{aft_beam}} + W_{\text{fwd_beam}})$$

Weight of external installation and cargo.

$$P_{\text{external}} = 270 \cdot \text{lbf}$$

$$P_{\text{ext}} := P_{\text{external}} \cdot \left(\frac{2}{3}\right)$$

Assume unequal distribution of cargo in basket; each beam can support 2/3 of cargo.

$$P_{\text{ext}} = 180 \cdot \text{lbf}$$

$$CG_{\text{external}} := \left(\frac{L_{\text{aft}_1}}{2} + L_{\text{aft}_2} + \frac{L_{\text{aft}_3}}{2} \right)$$

Lateral Center of Gravity of external cargo.
(conservative: ignores beams' inboard cg)

$$CG_{\text{external}} = 38.50 \cdot \text{in}$$

$$M_{\text{external}} := P_{\text{ext}} \cdot CG_{\text{external}}$$

Lateral Moment of external cargo per beam.

$$M_{\text{external}} = 6930 \cdot \text{in} \cdot \text{lbf}$$

$$P_{\text{bolt_aft,a}} := \frac{P_{\text{ext}}}{2}$$

Nominal vertical load on bolt "A" with max cargo.

$$P_{\text{bolt_aft,a}} = 90 \cdot \text{lbf}$$

$$P_{\text{bolt_aft,b}} := P_{\text{bolt_aft,a}}$$

Nominal vertical load on bolt "B" with max cargo.

$$P_{\text{bolt_aft,b}} = 90 \cdot \text{lbf}$$

$$P_{\text{bolt_aft,c}} := \frac{M_{\text{external}}}{L_{\text{aft}_3}} + \frac{P_{\text{ext}}}{2}$$

Nominal vertical load on bolt "C" with max cargo.

$$P_{\text{bolt_aft,c}} = 428 \cdot \text{lbf}$$

$$P_{\text{bolt_aft,d}} := \frac{M_{\text{external}}}{L_{\text{aft}_3}} - \frac{P_{\text{ext}}}{2}$$

Nominal vertical load on bolt "D" with max cargo.

$$P_{\text{bolt_aft,d}} = 248 \cdot \text{lbf}$$



Critical Vertical Loads

Ultimate manouvering load factor is critical.

$$n_{\text{man_ult}} = 5.25$$

$$P_Z := n_{\text{man_ult}} \cdot P_{\text{ext}}$$

Ultimate downward load on installation and cargo.

$$P_Z = 945 \cdot \text{lbf}$$

$$n_{\text{MAN-ULT}} \times P_{\text{EXTERNAL}} = 5.25 \times 250 = 1312 \text{ LB TEST LOAD}$$

Lateral Center of Gravity of external cargo.
(conservative: ignores beams' inboard cg)

$$CG_{\text{external}} = 38.50 \cdot \text{in}$$

$$M_X := P_Z \cdot CG_{\text{external}}$$

Ultimate Lateral Moment of external cargo.

$$M_X = 36383 \cdot \text{in} \cdot \text{lbf}$$

$$P_{Z_bolt_aft,a} := \frac{P_Z}{2}$$

Ultimate vertical load on bolt "A" with max cargo.

$$P_{Z_bolt_aft,a} = 473 \cdot \text{lbf}$$

$$P_{Z_bolt_aft,b} := P_{Z_bolt_aft,a}$$

Ultimate vertical load on bolt "B" with max cargo.

$$P_{Z_bolt_aft,b} = 473 \cdot \text{lbf}$$

$$P_{Z_bolt_aft,c} := \frac{M_X}{L_{aft_3}} + \frac{P_Z}{2}$$

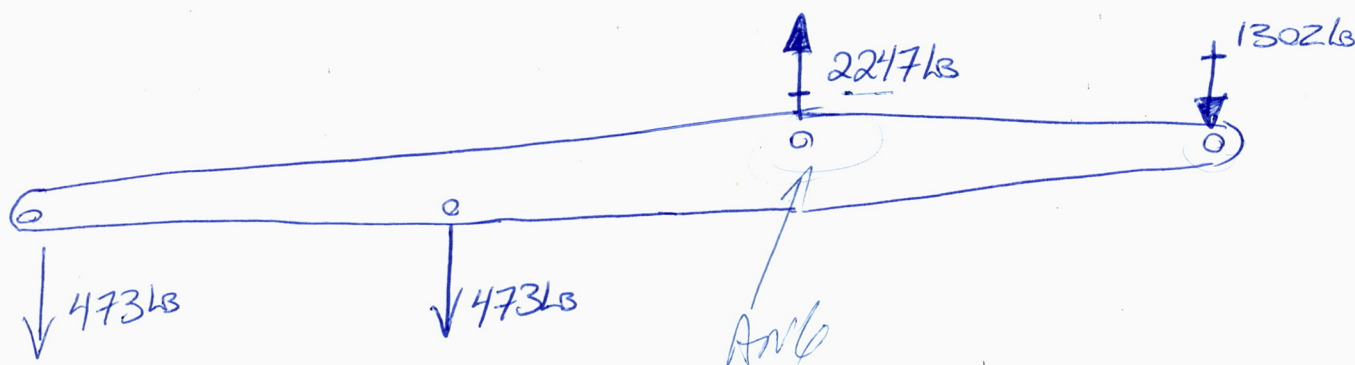
Ultimate vertical load on bolt "C" with max cargo.

$$P_{Z_bolt_aft,c} = 2247 \cdot \text{lbf}$$

$$P_{Z_bolt_aft,d} := \frac{M_X}{L_{aft_3}} - \frac{P_Z}{2}$$

Ultimate vertical load on bolt "D" with max cargo.

$$P_{Z_bolt_aft,d} = 1302 \cdot \text{lbf}$$



~~Critical Forward Load:~~**DRAG**

Forward Emergency Landing Load Factor.

$n_{fwd} = 4.0$

$P_X := n_{fwd} \cdot P_{ext}$

Ultimate forward load on installation and cargo.

$P_X = 720 \cdot \text{lbf}$

Lateral Center of Gravity of external cargo.
(conservative: ignores beams' inboard cg)

$CG_{external} = 38.50 \cdot \text{in}$

$M_Z := P_X \cdot CG_{external}$

Ultimate Lateral Moment of external cargo.

$M_Z = 27720 \cdot \text{in} \cdot \text{lbf}$

$P_{x_bolt_aft,a} := \frac{P_X}{2}$

Ultimate forward load on bolt "A" with max cargo.

$P_{x_bolt_aft,a} = 360 \cdot \text{lbf}$

$P_{x_bolt_aft,b} := P_{x_bolt_aft,a}$

Ultimate forward load on bolt "B" with max cargo.

$P_{x_bolt_aft,b} = 360 \cdot \text{lbf}$

$P_{x_bolt_aft,c} := \frac{M_Z}{L_{aft_3}} + \frac{P_X}{2}$

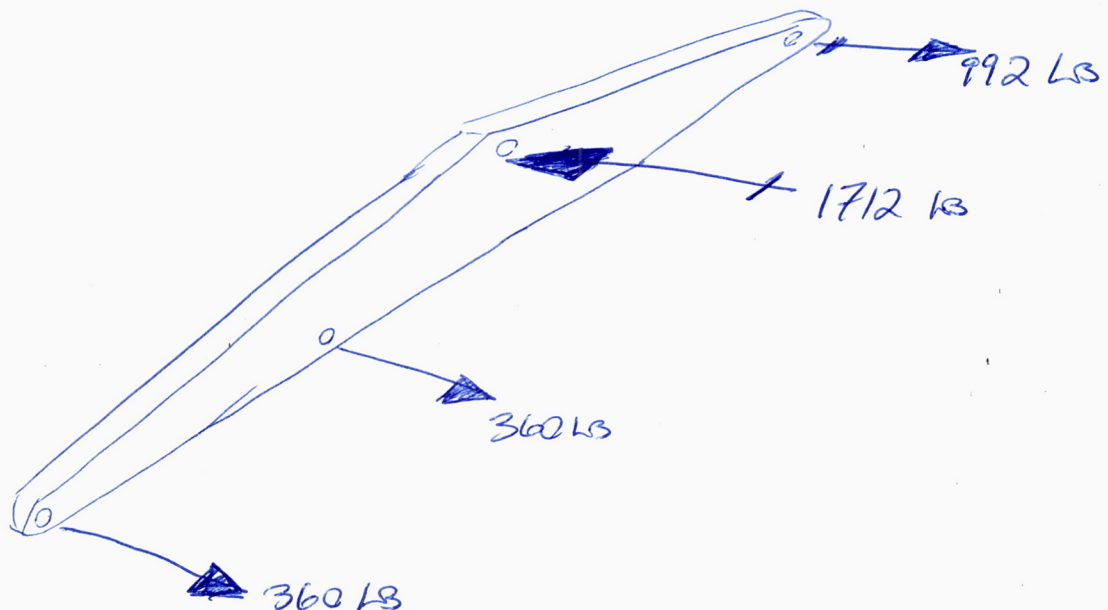
Ultimate forward load on bolt "C" with max cargo.

$P_{x_bolt_aft,c} = 1712 \cdot \text{lbf}$

$P_{x_bolt_aft,d} := \frac{M_Z}{L_{aft_3}} - \frac{P_X}{2}$

Ultimate forward load on bolt "D" with max cargo.

$P_{x_bolt_aft,d} = 992 \cdot \text{lbf}$



Stresses in Beam Mounting Bolts

Fitting Factor: FAR 27.625

$$n_{ff} := 1.15$$

Ultimate Tensile Strength of AN4 Bolt.

$$P_{tu_AN4} := 4170 \cdot \text{lbF}$$

Ultimate Shear Strength of AN4 Bolt.

$$P_{su_AN4} := 3682 \cdot \text{lbF}$$

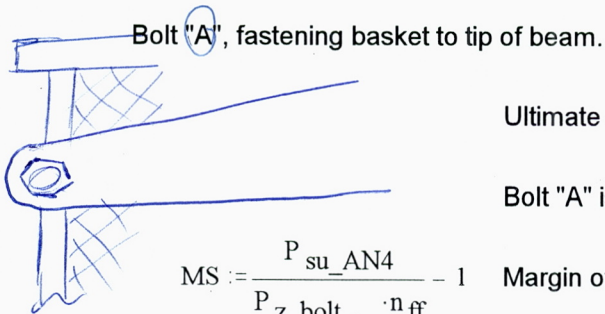
Ultimate Tensile Strength of AN6 Bolt.

$$P_{tu_AN6} := 10300 \cdot \text{lbF}$$

Ultimate Shear Strength of AN6 Bolt.

$$P_{su_AN6} := 8280 \cdot \text{lbF}$$

Forward Beam:



Ultimate down load on bolt "A" with max cargo.

$$P_{z_bolt_aft,a} = 473 \cdot \text{lbF}$$

Bolt "A" is an AN4.

$$P_{su_AN4} = 3682 \cdot \text{lbF}$$

$$MS := \frac{P_{su_AN4}}{P_{z_bolt_aft,a} \cdot n_{ff}} - 1$$

Margin of Safety

$$MS = 5.8$$

Ultimate forward load on bolt "A" with max cargo.

$$P_{x_bolt_aft,a} = 360 \cdot \text{lbF}$$

Bolt "A" is an AN4.

$$P_{tu_AN4} = 4170 \cdot \text{lbF}$$

$$MS := \frac{P_{tu_AN4}}{P_{x_bolt_aft,a} \cdot n_{ff}} - 1$$

Margin of Safety

$$MS = 9.1$$

Bolt "B", fastening basket to middle of beam.

Ultimate down load on bolt "B" with max cargo.

$$P_{z_bolt_aft,b} = 473 \cdot \text{lbF}$$

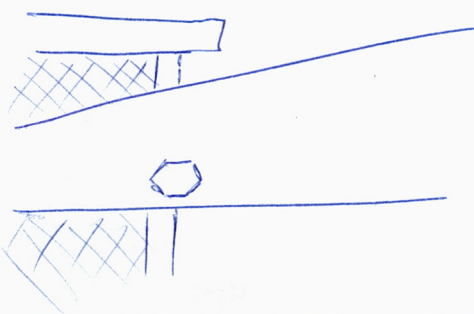
Bolt "B" is an AN4.

$$P_{su_AN4} = 3682 \cdot \text{lbF}$$

$$MS := \frac{P_{su_AN4}}{P_{z_bolt_aft,b} \cdot n_{ff}} - 1$$

Margin of Safety

$$MS = 5.8$$



~~DRAG~~
Ultimate forward load on bolt "B" with max cargo.

$$P_{x_bolt_aft,b} = 360 \cdot lbf$$

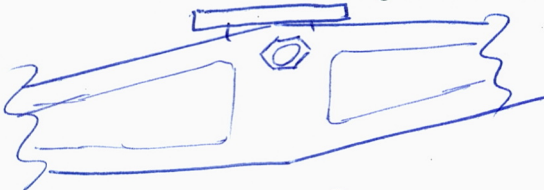
Bolt "B" is an AN4.

$$P_{tu_AN4} = 4170 \cdot lbf$$

$$MS := \frac{P_{tu_AN4}}{P_{x_bolt_aft,b} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 9.1$$

Bolt "C", fastening the beam to the right hand landing gear fitting.



Ultimate down load on bolt "C" with max cargo.

$$P_{z_bolt_aft,c} = 2247 \cdot lbf$$

Bolt "C" is an AN6.

$$P_{su_AN6} = 8280 \cdot lbf$$

$$MS := \frac{P_{su_AN6}}{P_{z_bolt_aft,c} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

AN6 MS = 2.2 ← CRITICAL
ANS MS =

~~DRAG~~
Ultimate forward load on bolt "C" with max cargo.

$$P_{x_bolt_aft,c} = 1712 \cdot lbf$$

Bolt "C" is an AN6.

$$P_{tu_AN6} = 1 \cdot 10^4 \cdot lbf$$

$$MS := \frac{P_{tu_AN6}}{P_{x_bolt_aft,c} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 4.2$$

Bolt "D", fastening the beam to the left hand landing gear fitting.

Ultimate down load on bolt "D" with max cargo.

$$P_{z_bolt_aft,d} = 1302 \cdot lbf$$

Bolt "D" is an AN6.

$$P_{su_AN6} = 8280 \cdot lbf$$

$$MS := \frac{P_{su_AN6}}{P_{z_bolt_aft,d} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 4.5$$

~~DRAG~~
Ultimate forward load on bolt "D" with max cargo.

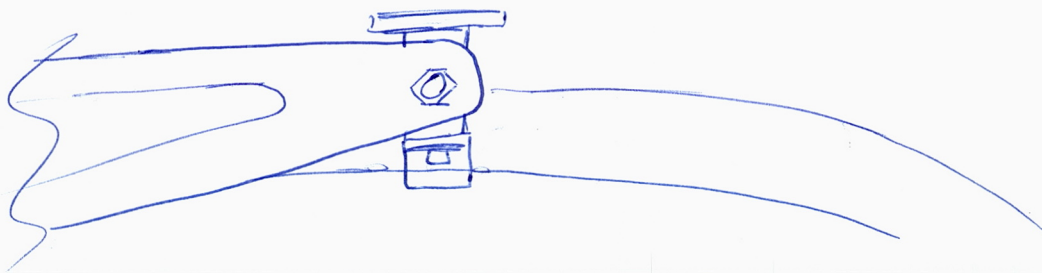
$$P_{x_bolt_aft,d} = 992 \cdot lbf$$

Bolt "D" is an AN6.

$$P_{tu_AN6} = 1 \cdot 10^4 \cdot lbf$$

$$MS := \frac{P_{tu_AN6}}{P_{x_bolt_aft,d} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 8.0$$



Beam Structural Analysis:

Ultimate Tensile Strength of 6061-T6 aluminum bar. (ref. Mil-Hdbk-5H)

AMS-224-225/8
Width of beam.

$F_{tu_6061T6} = 42 \text{ ksi}$
 ~~$F_{tu_6061T6} = 38 \text{ ksi}$~~

$w = 1.0 \cdot \text{in}$

Depth of beam at bolt "C".

$h_{aft_c} = 3.0 \cdot \text{in}$

$$I_{x_c} := \left(\frac{w}{12} \right) \cdot (h_{aft_c})^3 - \left(\frac{w}{12} \right) \cdot (h_{aft_c} - 1.5 \cdot \text{in})^3$$

Moment of Inertia of beam cross section at bolt "C" around the longitudinal axis.

$I_{x_c} = 1.97 \cdot \text{in}^4$

$$I_{z_c} := \left(\frac{h_{aft_c}}{12} \right) \cdot w^3 - \left(\frac{h_{aft_c} - 1.5 \cdot \text{in}}{12} \right) \cdot w^3$$

Moment of Inertia of beam cross section at bolt "C" around the vertical axis.

$I_{z_c} = 0.125 \cdot \text{in}^4$

Maximum Bending Moments at Bolt "C".

Nominal weight of external load on each beam.

$P_{ext} = 180 \cdot \text{lbf}$

$$M_{Z_ult_c} := P_{ext} \cdot \left[L_{aft_1} \cdot \left(\frac{1}{2} \right) + L_{aft_2} \right] \cdot n_{fwd}$$

Maximum Ultimate Forward Bending Moment at Bolt "C".

$M_{Z_ult_c} = 20340 \cdot \text{in} \cdot \text{lbf}$

$$M_{X_ult_c} := P_{ext} \cdot \left[L_{aft_1} \cdot \left(\frac{1}{2} \right) + L_{aft_2} \right] \cdot n_{man_ult}$$

Maximum Ultimate Forward Bending Moment at Bolt "C".

$M_{X_ult_c} = 26696 \cdot \text{in} \cdot \text{lbf}$

$$f_{b_fwd} := \frac{M_{Z_ult_c} \cdot \left(\frac{w}{2}\right)}{I_{Z_c}}$$

DRAG
Maximum Ultimate Forward Bending Stress
applied to Forward Beam.

$$f_{b_fwd} = 81.4 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061T6}}{f_{b_fwd} \cdot n_{ff}} - 1$$

Margin of Safety

~~NOT REQUIRED!~~

$$MS = -0.59$$

$$f_{b_down} := \frac{M_{X_ult_c} \cdot \left(\frac{h_{aft_c}}{2}\right)}{I_{X_c}}$$

MAN
Maximum Ultimate Forward Bending Stress
applied to Forward Beam.

$$f_{b_down} = 20.3 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061T6}}{f_{b_down} \cdot n_{ff}} - 1$$

Margin of Safety

$$MS = 0.62$$

ANALYSIS OF FORWARD BEAM:

Weight of basket.

$$W_{\text{basket}} := 50 \cdot \text{lbf}$$

Cargo Capacity of basket.

$$W_{\text{cargo}} := 200 \cdot \text{lbf}$$

Weight of aft beam.

$$W_{\text{aft_beam}} := 10 \cdot \text{lbf}$$

Weight of forward beam.

$$W_{\text{fwd_beam}} := 10 \cdot \text{lbf}$$

$$P_{\text{external}} := W_{\text{basket}} + W_{\text{cargo}} + (W_{\text{aft_beam}} + W_{\text{fwd_beam}})$$

Weight of external installation and cargo.

$$P_{\text{external}} = 270 \cdot \text{lbf}$$

$$P_{\text{ext}} := P_{\text{external}} \cdot \left(\frac{2}{3}\right)$$

Assume unequal distribution of cargo in basket; each beam can support 2/3 of cargo.

$$P_{\text{ext}} = 180 \cdot \text{lbf}$$

$$CG_{\text{external}} := \left(\frac{L_{\text{fwd}_1}}{2} + L_{\text{fwd}_2} + \frac{L_{\text{fwd}_3}}{2} \right)$$

Lateral Center of Gravity of external cargo.
(conservative: ignores beams' inboard cg)

$$CG_{\text{external}} = 38.50 \cdot \text{in}$$

$$M_{\text{external}} := P_{\text{ext}} \cdot CG_{\text{external}}$$

Lateral Moment of external cargo per beam.

$$M_{\text{external}} = 6930 \cdot \text{in} \cdot \text{lbf}$$

$$P_{\text{bolt}_{\text{fwd},a}} := \frac{P_{\text{ext}}}{2}$$

Nominal vertical load on bolt "A" with max cargo.

$$P_{\text{bolt}_{\text{fwd},a}} = 90.000 \cdot \text{lbf}$$

$$P_{\text{bolt}_{\text{fwd},b}} := P_{\text{bolt}_{\text{fwd},a}}$$

Nominal vertical load on bolt "B" with max cargo.

$$P_{\text{bolt}_{\text{fwd},b}} = 90.000 \cdot \text{lbf}$$

$$P_{\text{bolt}_{\text{fwd},c}} := \frac{M_{\text{external}}}{L_{\text{fwd}_3}} + \frac{P_{\text{ext}}}{2}$$

Nominal vertical load on bolt "C" with max cargo.

$$P_{\text{bolt}_{\text{fwd},c}} = 351 \cdot \text{lbf}$$

$$P_{\text{bolt}_{\text{fwd},d}} := \frac{M_{\text{external}}}{L_{\text{fwd}_3}} - \frac{P_{\text{ext}}}{2}$$

Nominal vertical load on bolt "D" with max cargo.

$$P_{\text{bolt}_{\text{fwd},d}} = 171 \cdot \text{lbf}$$

Critical Vertical Loads

Ultimate manouvering load factor is critical.

$$n_{\text{man_ult}} = 5.25$$

$$P_Z := n_{\text{man_ult}} \cdot P_{\text{ext}}$$

Ultimate downward load on installation and cargo.

$$P_Z = 945 \cdot \text{lbf}$$

Lateral Center of Gravity of external cargo.
(conservative: ignores beams' inboard cg)

$$CG_{\text{external}} = 38.50 \cdot \text{in}$$

$$M_X := P_Z \cdot CG_{\text{external}}$$

Ultimate Lateral Moment of external cargo.

$$M_X = 36383 \cdot \text{in} \cdot \text{lbf}$$

$$P_{Z_bolt_fwd,a} := \frac{P_Z}{2}$$

Ultimate vertical load on bolt "A" with max cargo.

$$P_{Z_bolt_fwd,a} = 473 \cdot \text{lbf}$$

$$P_{Z_bolt_fwd,b} := P_{Z_bolt_fwd,a}$$

Ultimate vertical load on bolt "B" with max cargo.

$$P_{Z_bolt_fwd,b} = 473 \cdot \text{lbf}$$

$$P_{Z_bolt_fwd,c} := \frac{M_X}{L_{fwd3}} + \frac{P_Z}{2}$$

Ultimate vertical load on bolt "C" with max cargo.

$$P_{Z_bolt_fwd,c} = 1840 \cdot \text{lbf}$$

$$P_{Z_bolt_fwd,d} := \frac{M_X}{L_{fwd3}} - \frac{P_Z}{2}$$

Ultimate vertical load on bolt "D" with max cargo.

$$P_{Z_bolt_fwd,d} = 895 \cdot \text{lbf}$$

Critical Forward Load:

Forward Emergency Landing Load Factor.

$$n_{fwd} = 4.0$$

$$P_X := n_{fwd} \cdot P_{ext}$$

Ultimate forward load on installation and cargo.

$$P_X = 720 \cdot \text{lbf}$$

Lateral Center of Gravity of external cargo.
(conservative: ignores beams' inboard cg)

$$CG_{external} = 38.50 \cdot \text{in}$$

$$M_{fwd} := P_X \cdot CG_{external}$$

Ultimate Lateral Moment of external cargo.

$$M_Z = 27720 \cdot \text{in} \cdot \text{lbf}$$

$$P_{x_bolt_{fwd,a}} := \frac{P_X}{2}$$

Ultimate forward load on bolt "A" with max cargo.

$$P_{x_bolt_{fwd,a}} = 360 \cdot \text{lbf}$$

$$P_{x_bolt_{fwd,b}} := P_{x_bolt_{fwd,a}}$$

Ultimate forward load on bolt "B" with max cargo.

$$P_{x_bolt_{fwd,b}} = 360 \cdot \text{lbf}$$

$$P_{x_bolt_{fwd,c}} := \frac{M_Z}{L_{fwd_3}} + \frac{P_X}{2}$$

Ultimate forward load on bolt "C" with max cargo.

$$P_{x_bolt_{fwd,c}} = 1402 \cdot \text{lbf}$$

$$P_{x_bolt_{fwd,d}} := \frac{M_Z}{L_{fwd_3}} - \frac{P_X}{2}$$

Ultimate forward load on bolt "D" with max cargo.

$$P_{x_bolt_{fwd,d}} = 682 \cdot \text{lbf}$$

Stresses in Beam Mounting Bolts

Fitting Factor: FAR 27.625

$$n_{ff} := 1.15$$

Ultimate Tensile Strength of AN4 Bolt.

$$P_{tu_AN4} := 4170 \cdot \text{lbf}$$

Ultimate Shear Strength of AN4 Bolt.

$$P_{su_AN4} := 3682 \cdot \text{lbf}$$

Ultimate Tensile Strength of AN6 Bolt.

$$P_{tu_AN6} := 10300 \cdot \text{lbf}$$

Ultimate Shear Strength of AN6 Bolt.

$$P_{su_AN6} := 8280 \cdot \text{lbf}$$

Forward Beam:

Bolt "A", fastening basket to tip of beam.

Ultimate down load on bolt "A" with max cargo.

$$P_{z_bolt_fwd,a} = 473 \cdot \text{lbf}$$

Bolt "A" is an AN4.

$$P_{su_AN4} = 3682 \cdot \text{lbf}$$

$$MS := \frac{P_{su_AN4}}{P_{z_bolt_fwd,a} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 5.8$$

Ultimate forward load on bolt "A" with max cargo.

$$P_{x_bolt_fwd,a} = 360 \cdot \text{lbf}$$

Bolt "A" is an AN4.

$$P_{tu_AN4} = 4170 \cdot \text{lbf}$$

$$MS := \frac{P_{tu_AN4}}{P_{x_bolt_fwd,a} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 9.1$$

Bolt "B", fastening basket to middle of beam.

Ultimate down load on bolt "B" with max cargo.

$$P_{z_bolt_fwd,b} = 473 \cdot \text{lbf}$$

Bolt "B" is an AN4.

$$P_{su_AN4} = 3682 \cdot \text{lbf}$$

$$MS := \frac{P_{su_AN4}}{P_{z_bolt_fwd,b} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 5.8$$

Ultimate forward load on bolt "B" with max cargo.

$$P_{x_bolt_fwd,b} = 360 \cdot \text{lbf}$$

Bolt "B" is an AN4.

$$P_{tu_AN4} = 4170 \cdot \text{lbf}$$

$$MS := \frac{P_{tu_AN4}}{P_{x_bolt_fwd,b} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 9.1$$

Bolt "C", fastening the beam to the right hand landing gear fitting.

Ultimate down load on bolt "C" with max cargo.

$$P_{z_bolt_fwd,c} = 1840 \cdot \text{lbf}$$

Bolt "C" is an AN6.

$$P_{su_AN6} = 8280 \cdot \text{lbf}$$

$$MS := \frac{P_{su_AN6}}{P_{z_bolt_fwd,c} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 2.9$$

Ultimate forward load on bolt "C" with max cargo.

$$P_{x_bolt_fwd,c} = 1402 \cdot \text{lbf}$$

Bolt "C" is an AN6.

$$P_{tu_AN6} = 1 \cdot 10^4 \cdot \text{lbf}$$

$$MS := \frac{P_{tu_AN6}}{P_{x_bolt_fwd,c} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 5.4$$

Bolt "D", fastening the beam to the left hand landing gear fitting.

Ultimate down load on bolt "D" with max cargo.

$$P_{z_bolt_fwd,d} = 895 \cdot \text{lbf}$$

Bolt "D" is an AN6.

$$P_{su_AN6} = 8280 \cdot \text{lbf}$$

$$MS := \frac{P_{su_AN6}}{P_{z_bolt_fwd,d} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 7.0$$

Ultimate forward load on bolt "D" with max cargo.

$$P_{x_bolt_fwd,d} = 682 \cdot \text{lbf}$$

Bolt "D" is an AN6.

$$P_{tu_AN6} = 1 \cdot 10^4 \cdot \text{lbf}$$

$$MS := \frac{P_{tu_AN6}}{P_{x_bolt_fwd,d} \cdot n_{ff}} - 1 \quad \text{Margin of Safety}$$

$$MS = 12$$

Beam Structural Analysis:

Ultimate Tensile Strength of 6061-T6 aluminum bar. (ref. Mil-Hdbk-5H)

AMS-QQ-A-225/8
Width of beam.

Depth of beam at bolt "C".

$$I_{x_c} := \left(\frac{w}{12}\right) \cdot (h_{fwd_c})^3 - \left(\frac{w}{12}\right) \cdot (h_{fwd_c} - 1.5 \cdot \text{in})^3$$

Moment of Inertia of beam cross section at bolt "C" around the longitudinal axis.

$$I_{z_c} := \left(\frac{h_{fwd_c}}{12}\right) \cdot w^3 - \left(\frac{h_{fwd_c} - 1.5 \cdot \text{in}}{12}\right) \cdot w^3$$

Moment of Inertia of beam cross section at bolt "C" around the vertical axis.

Maximum Bending Moments at Bolt "C".

Nominal weight of external load on each beam.

$$M_{Z_ult_c} := P_{ext} \cdot \left[L_{fwd_1} \cdot \left(\frac{1}{2}\right) + L_{fwd_2} \right] \cdot n_{fwd}$$

Maximum Ultimate Forward Bending Moment at Bolt "C".

$$M_{X_ult_c} := P_{ext} \cdot \left[L_{fwd_1} \cdot \left(\frac{1}{2}\right) + L_{fwd_2} \right] \cdot n_{man_ult}$$

Maximum Ultimate Forward Bending Moment at Bolt "C".

Handwritten: 112

$$F_{tu_6061T6} := 38 \cdot \text{ksi}$$

$$w := 1.0 \cdot \text{in}$$

$$h_{fwd_c} := 3.0 \cdot \text{in}$$

$$I_{x_c} = 1.97 \cdot \text{in}^4$$

$$I_{z_c} = 0.125 \cdot \text{in}^4$$

$$P_{ext} = 180 \cdot \text{lbf}$$

$$M_{Z_ult_c} = 18144 \cdot \text{in} \cdot \text{lbf}$$

$$M_{X_ult_c} = 23814 \cdot \text{in} \cdot \text{lbf}$$

$$f_{b_fwd} := \frac{M_{Z_ult_c} \cdot \left(\frac{w}{2}\right)}{I_{Z_c}}$$

Maximum Ultimate Forward Bending Stress
applied to Forward Beam.

$$f_{b_fwd} = 72.6 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061T6}}{f_{b_fwd} \cdot n_{ff}} - 1$$

Margin of Safety

NOT REQUIRED!

$$MS = -0.54$$

$$f_{b_down} := \frac{M_{X_ult_c} \cdot \left(\frac{h_{fwd_c}}{2}\right)}{I_{X_c}}$$

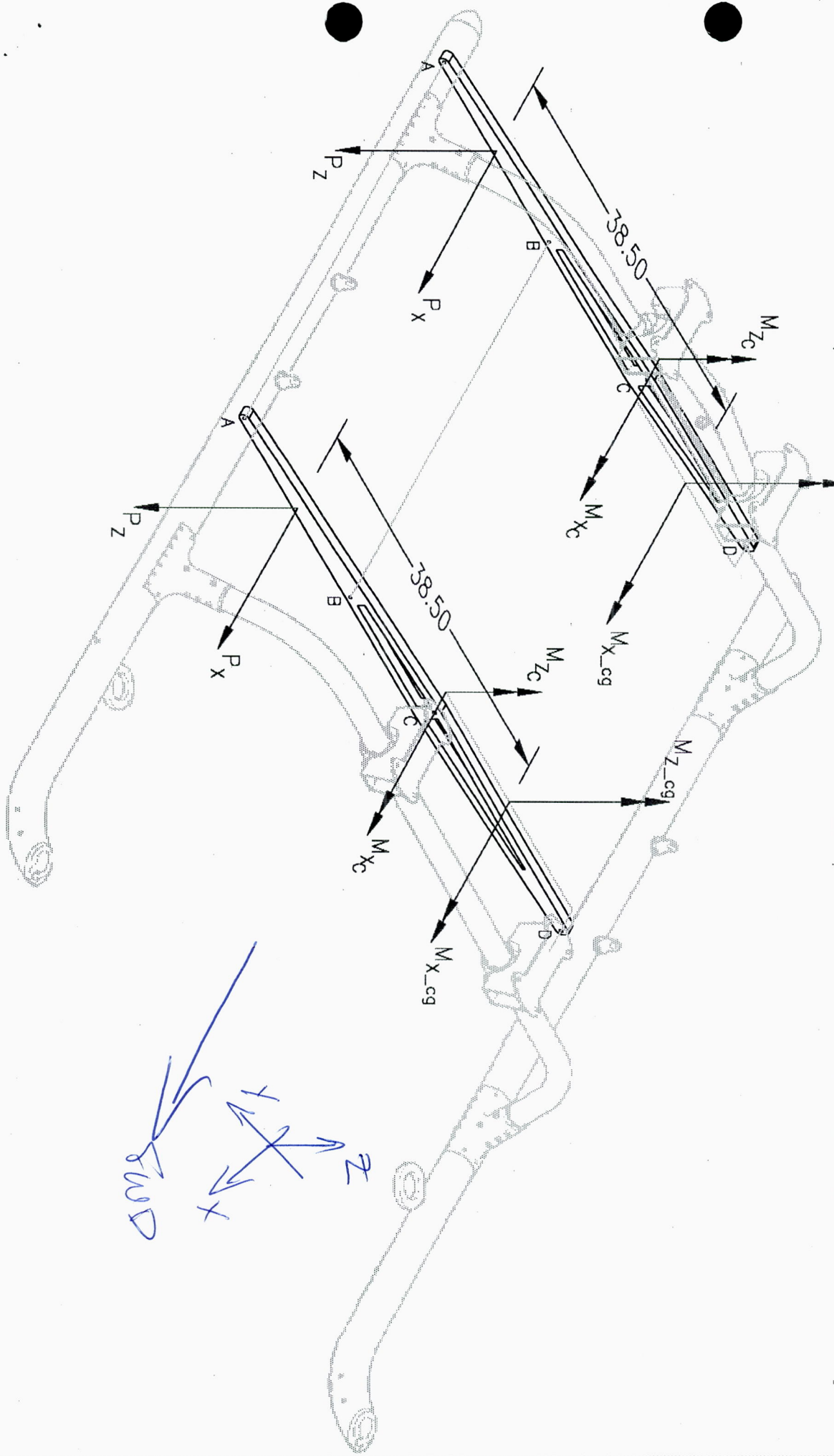
Maximum Ultimate Forward Bending Stress
applied to Forward Beam.

$$f_{b_down} = 18.1 \cdot \text{ksi}$$

$$MS := \frac{F_{tu_6061T6}}{f_{b_down} \cdot n_{ff}} - 1$$

Margin of Safety

$$MS = 0.82$$



FAX

Transport Canada
Aircraft Certification Division (RAED)
#1100, 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Date 3-Apr-02

No. of pages (including cover sheet) 3

FAXED
3 pages
Apr 3/02

To: **AERO DESIGN LTD.**
ATT: TED BURGOIN
Phone (403) 250-8027
Fax Phone (403) 250-8333

From **Debbie Dubyk**
Phone (780) 495-7412
Fax Phone (780) 495-7963

Our File: **C-02-0218 (RAED)**

Your File **492**

**SUBJECT: REVISION OF SUPPLEMENTAL TYPE APPROVAL SH00-48 – PROCEEDING
TO ISSUE 2 – INSTALLATION OF RIGHT-HAND SIDE MOUNTED CARGO
BASKET – BELL 206L, 206L-1, 206L-3, 206L-4
APPLICANT: AERO DESIGN LTD.**

Hi Ted:

Please find enclosed the application pertaining to the above noted project which Jack Staal has signed. Also attached is a Notice of Project Letter dated April 3, 2002. The original copies of these documents will be sent to you in the mail today.

Thanks

Debbie

Debbie Dubyk

Operational Support Clerk



Canada



Transport
Canada

Transports
Canada

Civil Aviation
Prairie and Northern Region

Aviation civile
Région des prairies et du nord

Aircraft Certification
Prairie and Northern Region
1100-9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Your file Votre référence

Our file Notre référence

File: **C-02-0218 (RAED)**

April 3, 2002

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, Alberta
T2E 7G9 CANADA

Dear Sir :

Subject: Aircraft Type: SH00-48 – Proceeding to Issue 2
 Bell 206L, 206L-1, 206L-3, 206L-4
 Registration : N/A
 Installation : Installation of Right-Hand Side Mounted Cargo Basket

We have received your proposal or application dated 12 March 2002, requesting approval of the subject installation.

The above file number has been assigned to this project and should be referenced when communicating with us on this subject. The submitted application and supporting documents will be reviewed.

It should be noted that the review make take some time due to our workload and that further communication may be required, both technically and in terms of scheduling.

The modification or repair design proposal must be approved so that the aircraft will be able to conform to a certified type design, allowing the flight authority to remain in force (ref. CAR 507.02 through 507.04, 507.11, and 605.03(1)).

Please note that STC/STA kits which include the manufacture of parts at your facility for resale require your facility to be approved under Chapter 561 of the Airworthiness Manual.

If you should wish to discuss this project further, please do not hesitate to contact the undersigned.

Yours truly,

for J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: (780) 495-5227
Fax: (780) 495-7963

cc: RACH Calgary

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD-492, Rev. 0

1. NAME AND ADDRESS OF APPLICANT:

AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, AB, T2E 7G9

2. IDENTIFICATION OF PRODUCT

MAKE:

Bell Helicopter

MODEL:

206L, 206L-1,
206L-3, 206L-4

ALL CORRESPONDANCE TO:

AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, AB, T2E 7G9

SERIAL No.:

REGISTRATION:

3. REQUEST FOR:

- A. SUPPLEMENTAL TYPE CERTIFICATE (STC) ☐
- B. STC/STA REVISION ☒ STC/STA No. SH00-48
- C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC) ☐
- D. LIMITED STC/STA REVISION ☐ LSTC/LSTA No.
- E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE ☐
- F. F.A.A. STC REVISION ☐ STC No.
- G. FAMILIARIZATION OF F.A.A. STC ☐ STC No.
- H. REPAIR DESIGN APPROVAL (RDC) ☐
- I. PARTS DESIGN APPROVAL (PDA) ☐

4. TITLE OF MODIFICATION OR REPAIR:

Installation of Right-Hand-Side-Mounted Cargo Basket

5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:

Basket is 74" long and 22" deep. Located on right-hand side of helicopter, below doors, between cross-tubes. Supported on beams which are mounted to External Attachment Provisions.

6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:

A. TA NO. H-92

B. TC No.

C. OTHER

7. PROPOSED BASIS OF APPROVAL:

A. SAME AS TA ☒ B. SAME AS TC ☐ C. OTHER ☐ (Please specify)

8. DOCUMENTATION CHECKLIST	REQUIRED		FOR DOT USE ONLY		
	YES	NO	RECEIVED		DATE
COMPLIANCE PROGRAM	X				
MASTER DRAWING LIST	X				
FLIGHT MANUAL SUPPLEMENT	X				
MAINTENANCE MANUAL SUPPLEMENT	X				
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS	X				
ENGINEERING REPORTS	X				
DESIGN DRAWINGS		X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X				
ELECTRICAL LOAD ANALYSIS		X			
DRAFT STC, LSTC OR RDA		X			
WEIGHT AND MOMENT CHANGE	X				
FLIGHT TEST DATA	X				
OTHER (Specify)					

9. APPLICANT'S REMARKS:

10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

PER:

Consultant

12 March, 2002

SIGNATURE OF APPLICANT

TITLE

DATE

11.

SIGNATURE OF REGIONAL ENGINEER

DATE

59/002

C-02-0218

2002/03/22

FAX

Transport Canada
Aircraft Certification Division (RAED)
#1100, 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Date 3-Apr-02No. of pages (including cover sheet) 3

3 pages
Apr 3/02

To: **AERO DESIGN LTD.**ATT: **TED BURGOIN**Phone (403) 250-8027Fax Phone (403) 250-8333From **Debbie Dubyk**Phone (780) 495-7412Fax Phone (780) 495-7963Our File: **C-02-0218 (RAED)**Your File **492**

**SUBJECT: REVISION OF SUPPLEMENTAL TYPE APPROVAL SH00-48 – PROCEEDING
TO ISSUE 2 – INSTALLATION OF RIGHT-HAND SIDE MOUNTED CARGO
BASKET – BELL 206L, 206L-1, 206L-3, 206L-4
APPLICANT: AERO DESIGN LTD.**

Hi Ted:

Please find enclosed the application pertaining to the above noted project which Jack Staal has signed. Also attached is a Notice of Project Letter dated April 3, 2002. The original copies of these documents will be sent to you in the mail today.

Thanks

Debbie
Debbie Dubyk

Operational Support Clerk

Transport
CanadaTransports
CanadaCivil Aviation
Prairie and Northern RegionAviation civile
Région des prairies et du nordAircraft Certification
Prairie and Northern Region
1100-9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Your file Votre référence

Our file Notre référence

File: C-02-0218 (RAED)

April 3, 2002

Aero Design Ltd.
1045 McTavish Road, N.E.
Calgary, Alberta
T2E 7G9 CANADA

Dear Sir :

Subject: Aircraft Type: SH00-48 - Proceeding to Issue 2
Bell 206L, 206L-1, 206L-3, 206L-4
Registration : N/A
Installation : Installation of Right-Hand Side Mounted Cargo Basket

We have received your proposal or application dated 12 March 2002, requesting approval of the subject installation.

The above file number has been assigned to this project and should be referenced when communicating with us on this subject. The submitted application and supporting documents will be reviewed.

It should be noted that the review may take some time due to our workload and that further communication may be required, both technically and in terms of scheduling.

The modification or repair design proposal must be approved so that the aircraft will be able to conform to a certified type design, allowing the flight authority to remain in force (ref. CAR 507.02 through 507.04, 507.11, and 605.03(1)).

Please note that STC/STA kits which include the manufacture of parts at your facility for resale require your facility to be approved under Chapter 561 of the Airworthiness Manual.

If you should wish to discuss this project further, please do not hesitate to contact the undersigned.

Yours truly,

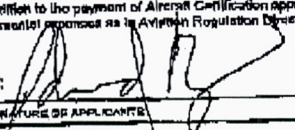

J. Staal
Aircraft Certification Engineering Technologist
Prairie and Northern Region
Phone: (780) 495-5227
Fax: (780) 495-7963

cc: RACH Calgary

Canada

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD492, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		2. IDENTIFICATION OF PRODUCT MAKE: Bell Helicopter		MODEL: 206L, 206L-1, 206L-3, 206L-4	
ALL CORRESPONDANCE TO: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9		SERIAL No.:		REGISTRATION:	
3. REQUEST FOR:					
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>			
B. STC/STA REVISION		<input checked="" type="checkbox"/> STC/STA No. SH00-48			
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>			
D. LIMITED STC/STA REVISION		<input type="checkbox"/> LSTC/STA No.			
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>			
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.			
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.			
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>			
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>			
4. TITLE OF MODIFICATION OR REPAIR: Installation of Right-Hand-Side Mounted Cargo Basket					
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Basket is 74" long and 22" deep. Located on right-hand side of helicopter, below doors, between cross-tubes. Supported on beams which are mounted to External Attachment Provisions.					
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:					
A. TA NO. H-92		B. TC No.		C. OTHER	
7. PROPOSED BASIS OF APPROVAL:					
A. SAME AS TA <input checked="" type="checkbox"/>		B. SAME AS TC <input type="checkbox"/>		C. OTHER <input type="checkbox"/> (Please specify)	
8. DOCUMENTATION CHECKLIST		REQUIRED		PRODUCT USE ONLY	
		YES	NO		
COMPLIANCE PROGRAM		X			
MASTER DRAWING LIST		X			
FLIGHT MANUAL SUPPLEMENT		X			
MAINTENANCE MANUAL SUPPLEMENT		X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS		X			
ENGINEERING REPORTS		X			
DESIGN DRAWINGS			X		
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X			
ELECTRICAL LOAD ANALYSIS			X		
DRAFT STC, LSTC OR RDA			X		
WEIGHT AND MOMENT CHANGE		X			
FLIGHT TEST DATA		X			
OTHER (specify)					
9. APPLICANT'S REMARKS:					
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Document No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMAA ST3/4.					
PER: 		Consultant		12 March, 2002	
SIGNATURE OF APPLICANT		TITLE		DATE	
11. 				2002/03/22	
SIGNATURE OF REGIONAL ENGINEER				DATE	

Form MOD, 22 March, 2001

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	March 21, 2002	TIME:	11:27 AM
TO:	Dan Hauver	PHONE:	450-468-3431
	Heli-Craft	FAX:	450-468-5497
FROM:	S. Fahey	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 6

RE: BELL 206L AND 206B BASKETS

Dan:

As per our discussion, some photos of the 407 basket installation and sketches of the 206 designs we're working on.

The 407 basket is approved and flying in BC. Mounted high to avoid snow. Blocks right-hand passenger door, so push-out emergency exit window must be installed.

The 206L and 206B baskets are below the door and, if required, the passenger can exit over the basket. They are shorter to fit between cross-tubes, therefore too short for skis.

The 407 basket weighs about 45 pounds, plus the two attachment beams which weight 10 pounds each. 206B/L baskets will weigh slightly less.

One person can install basket on 407 in about 40 minutes.

No inserts to be potted into belly of the helicopter. Remove the basket installation and you will never know it was there.

Can have basket available for the beginning of May approved under an LSTC to get you flying. Full STC will follow because it takes a bit longer.

Please tell us your thoughts as the design is still in the prototype phase.

Regards,

Steve

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	March 19, 2002	TIME:	12:07 PM
TO:	Heli-Inter	PHONE:	
	Carol Moreau	FAX:	418-673-6442
FROM:	E. Burgoin	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet:

RE: BELL 206L AND 206B BASKETS

Carol Moreau:

As per our discussion attached are some sketches for your information. My apologies for the delay in getting this to you

The 407 installations are what we make and have approved for skiing. Basket is high to avoid snow and blocks the right hand passenger door. Pushout emergency exit window is required.

The 206L and 206B baskets are not suitable for skiing because too short, but are below the door and if required passenger can exit over basket.

The 407 basket (without attachment structure) weighs approximately 35 lbs with forward and aft attachment structure weighing approx 15 lb each. The Bell 206B and 206L baskets will weigh slightly less

On person can install the basket in about 40 minutes on Bell 407.

No inserts to be potted into the belly of the helicopter that requires modification of the basic helicopter structure. Remove the installation and you will never know it was ever on there.

Can have basket available for you for beginning of May approved under an LSTC in order to get you flying. Full STC will follow and take a bit longer

Please advise what your thoughts are.

Regards,



E. Burgoin

AERO DESIGN LTD.
1045 McTavish Rd. N. E.
Calgary, Alberta, T2E 7G9

F A X C O V E R S H E E T

DATE:	April 24, 2002	TIME:	10:02 AM
TO:	Tony	PHONE:	450-468-3431
	Taiga Helicopter	FAX:	450-468-5497
FROM:	S. Fahey	PHONE:	403-250-8027
	Aero Design Ltd.	FAX:	403-250-8333

Number of pages including cover sheet: 6

RE: BELL 206L BASKETS

Tony:

As per our discussion, some photos of the 407 basket installation and sketches of the 206 designs we're working on.

The 407 basket is approved and flying in BC. Mounted high to avoid snow. Blocks right-hand passenger door, so push-out emergency exit window must be installed.

The 206L baskets are below the door and, if required, the passenger can exit over the basket. They are shorter to fit between cross-tubes, therefore too short for skis.

The 407 basket weighs about 45 pounds, plus the two attachment beams which weight 10 pounds each. 206B/L baskets will weigh slightly less.

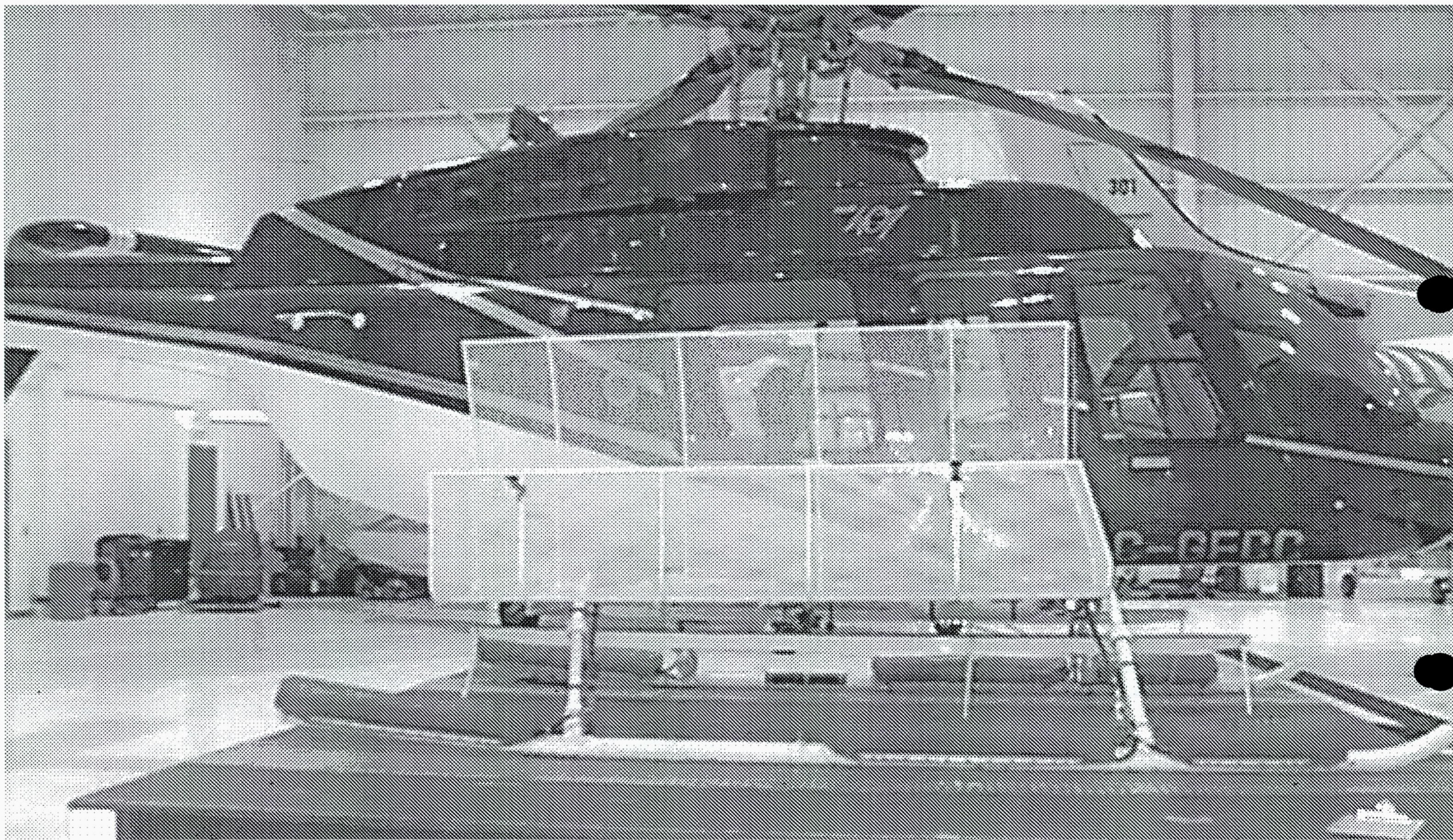
One person can install basket on 407 in about 40 minutes.

No inserts to be potted into belly of the helicopter. Remove the basket installation and you will never know it was there.

Should have basket available in May approved under an STC.

Regards,

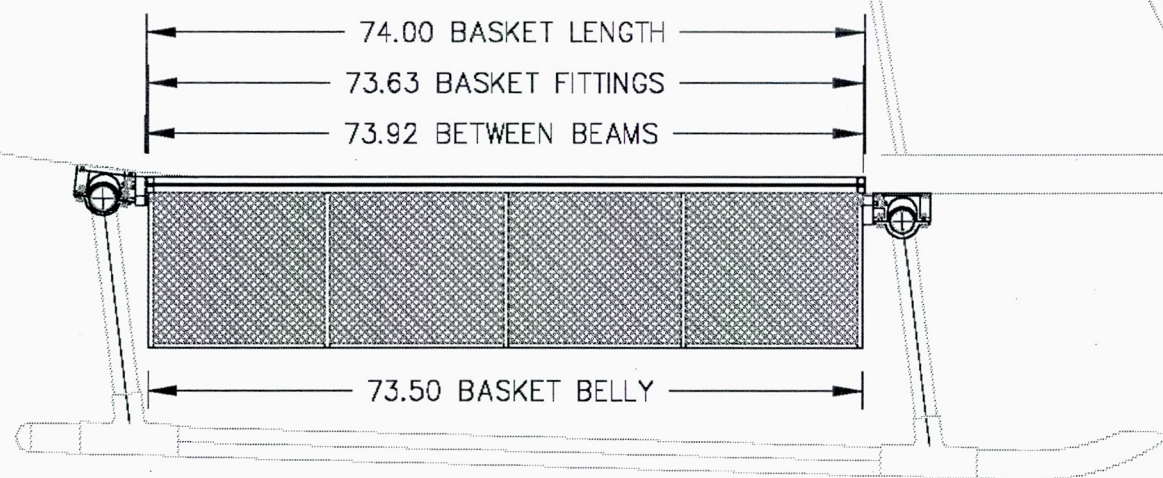
Steve



Bell 407

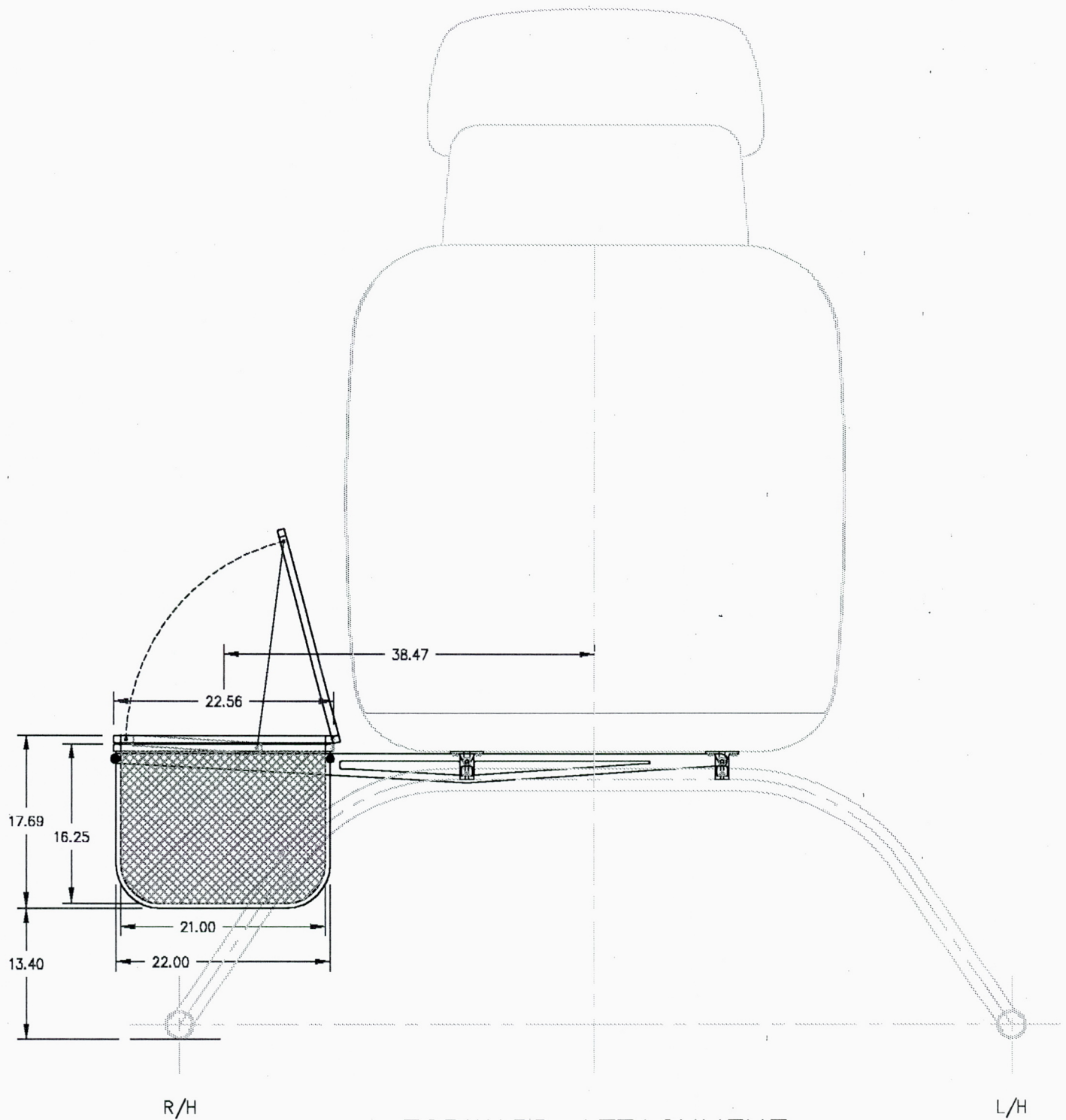


BELL 407

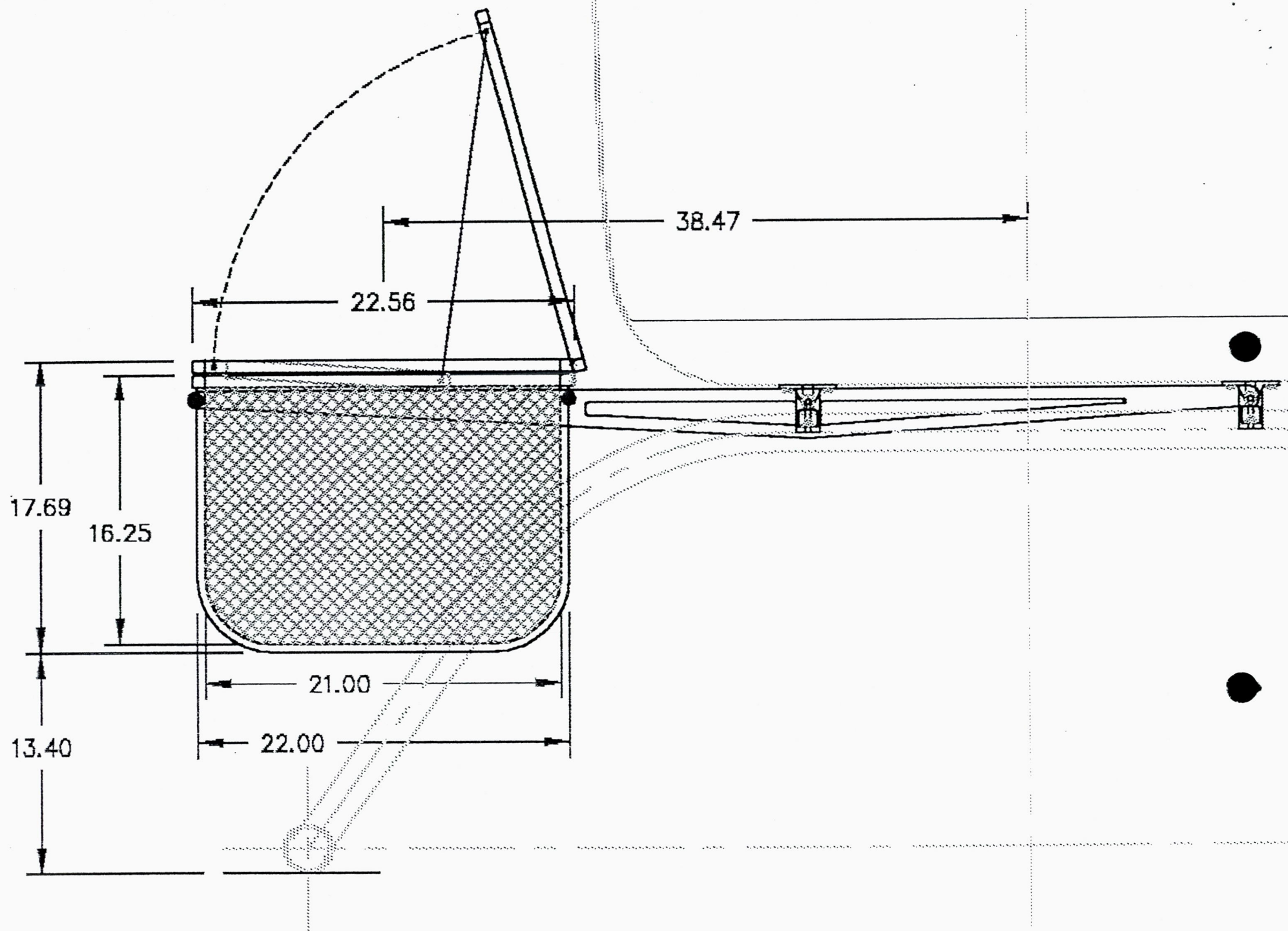


BELL 206L ON HIGH SKID GEAR

BELL 206L

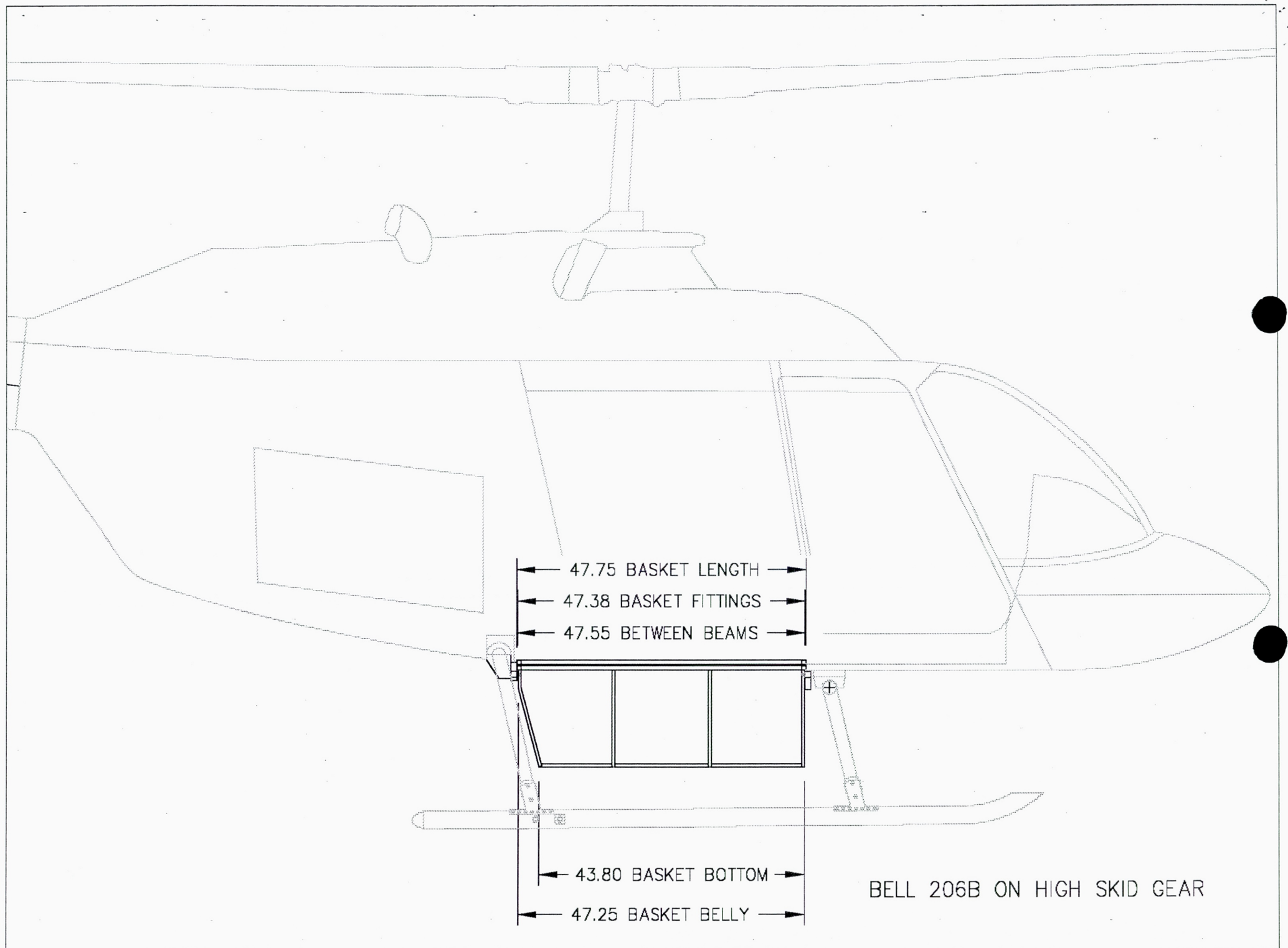


FORWARD ATTACHMENT
LOOKING AFT



R/H

FORWARD ATTACHMENT



AERO DESIGN LTD.

1045 McTavish Rd. N.E.
Calgary, Alberta
T2E 7G9

14 March, 2002

Transport Canada
Aircraft Certification Division,
800 – 1601 Airport Road
Calgary, AB,
T2E 7Z8

Attn: Mr. Greg Oucharek

Our File: 492
Your File: n/a

Re: Installation of Right-Hand-Side-Mounted Cargo Basket on Bell 206L

Greg:

The following documents are enclosed with this letter:

Modification Approval Request Application Form	MOD492	Rev. 0
Compliance Program (already submitted by fax)	CP492	Rev. 0
Project Summary	PS492	Rev. 0

This installation is similar to the cargo basket we mounted on a 407 in SH00-48. This basket is shorter, and mounted lower to clear the doors.

Regards,

E. Burgoin, P. Eng., DAR 290M


Encl.

Job 492

PS, 492 Rev. 0

12 March, 2002

Side-Mounted Cargo Basket

Type and Model: Bell 206L series

Project Summary

The basket fits between the cross-tubes, and below the doors, providing a 74" x 22" cargo area that does not obstruct exit from the helicopter. The basket is bolted to two beams, fore and aft. The beams pick up on fastener locations in the landing gear fittings. The original landing gear fittings are replaced with fittings specifically designed to provide mounting provisions for the beams (see Job 493).

Approval: STC

Customer: Aero Design Ltd.

AERO DESIGN LTD.

1045 McTavish Rd. N.E.
Calgary, Alberta
T2E 7G9

14 March, 2002

Transport Canada
Aircraft Certification Division,
800 – 1601 Airport Road
Calgary, AB,
T2E 7Z8

Attn: Mr. Greg Oucharek

Our File: 493
Your File: n/a

Re: Installation of External Attachment Provisions on Bell 206L

Greg:

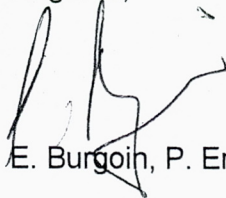
The following documents are enclosed with this letter:

Modification Approval Request Application Form	MOD493	Rev. 0
Compliance Program (already submitted by fax)	CP493	Rev. 0
Project Summary	PS493	Rev. 0



This installation permits convenient mounting of the basket to the belly of the helicopter.

Regards,



E. Burgoin, P. Eng., DAR 290M

Encl.

Job 493

PS, 493 Rev. 0

12 March, 2002

External Attachment Provisions

Type and Model: Bell 206L series

Project Summary

Convenient provisions are required for mounting a cargo basket to the bottom of the Bell light helicopter. Provisions are installed which simplify the installation of the basket.

Approval: LSTC

Customer: Aero Design Ltd.

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD492, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9	2. IDENTIFICATION OF PRODUCT	
	MAKE: Bell Helicopter	MODEL: 206L, 206L-1, 206L-3, 206L-4
ALL CORRESPONDANCE TO: AERO Design Ltd. 1045 McTavish Rd. N.E. Calgary, AB, T2E 7G9	SERIAL No.:	REGISTRATION:

3. REQUEST FOR:

A. SUPPLEMENTAL TYPE CERTIFICATE (STC)	<input type="checkbox"/>	
B. STC/STA REVISION	<input checked="" type="checkbox"/>	STC/STA No. SH00-48
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)	<input type="checkbox"/>	
D. LIMITED STC/STA REVISION	<input type="checkbox"/>	LSTC/LSTA No.
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE	<input type="checkbox"/>	
F. F.A.A. STC REVISION	<input type="checkbox"/>	STC No.
G. FAMILIARIZATION OF F.A.A. STC	<input type="checkbox"/>	STC No.
H. REPAIR DESIGN APPROVAL (RDC)	<input type="checkbox"/>	
I. PARTS DESIGN APPROVAL (PDA)	<input type="checkbox"/>	

4. TITLE OF MODIFICATION OR REPAIR:
Installation of Right-Hand-Side-Mounted Cargo Basket

5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:
Basket is 74" long and 22" ^{WIDE} deep. Located on right-hand side of helicopter, below doors, between cross-tubes. Supported on beams which are mounted to External Attachment Provisions.

6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:

A. TA NO. H-92	B. TC No.	C. OTHER
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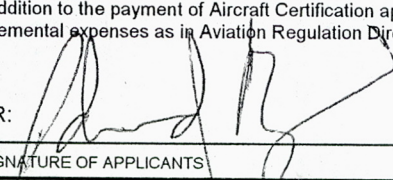
7. PROPOSED BASIS OF APPROVAL:

A. SAME AS TA <input checked="" type="checkbox"/>	B. SAME AS TC <input type="checkbox"/>	C. OTHER <input type="checkbox"/> (Please specify)
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8. DOCUMENTATION CHECKLIST	REQUIRED		FOR DOT USE ONLY		
			RECEIVED		
	YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM	X				
MASTER DRAWING LIST	X				
FLIGHT MANUAL SUPPLEMENT	X				
MAINTENANCE MANUAL SUPPLEMENT	X				
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS	X				
ENGINEERING REPORTS	X				
DESIGN DRAWINGS		X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X				
ELECTRICAL LOAD ANALYSIS		X			
DRAFT STC, LSTC OR RDA		X			
WEIGHT AND MOMENT CHANGE	X				
FLIGHT TEST DATA	X				
OTHER (Specify)					

9. APPLICANT'S REMARKS:

10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

PER: 	Consultant	12 March, 2002
SIGNATURE OF APPLICANTS	TITLE	DATE

11.

SIGNATURE OF REGIONAL ENGINEER	DATE
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AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
1045 McTavish Rd. N.E.
Calgary, Alberta, T2E 7G9

DATE: 12 March, 2002
REV. No. 0

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4

REGISTRATION:
SERIAL No.:

NATURE OF WORK: Installation of Side-Mounted Cargo Basket

MODEL CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.
MODIFICATION CERTIFICATION BASIS: FAR 27, Amendment 27-24, with exceptions as noted below.

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
Subpart B – Flight					
27.27	24	Centre of Gravity Limits	N/A		No change from Type Approval.
27.29	24	Empty Weight and Corresponding C of G	Data specified on inst'n drawing	X	
27.65	24	Climb: All Engines Operating	Flight Test	X	Determine ROC at V_y .
27.71	24	Gliding Performance	Flight Test	X	Determine ROD in autorotation.
27.141	20	Flight Characteristics – General	Flight Test	X	
27.143	1	Controllability and Maneuverability	Flight Test	X	
27.151	24	Flight controls	Flight Test	X	
27.161	24	Trim	Flight Test	X	
27.171	24	Stability – General	Flight Test	X	
27.173	1	Longitudinal Stability	Flight Test	X	
27.175	1	Demonstration of Longitudinal Stability	Flight Test	X	
27.251	24	Vibration	Flight Test	X	
Subpart C – Strength Requirements					
27.301	24	Loads – Air Drag Loads	Analysis	X	
27.301	24	Loads – Inertia Loads	Compliance with 27.337 and 27.561	X	
27.303	24	Factor of Safety	Analysis	X	
27.307	28	Proof of Structure	Analysis and Test iaw AC 43.13-1A	X	

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.				
27.337(a)	28 Limit Maneuvering Load Factor – Positive (3.5g)	Analysis and Test iaw AC 43.13-1A		X	Critical load factor in downward direction.
27.561	24 Emergency Landing Conditions	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(i)	24 Emergency Landing Conditions – Up (1.5g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(ii)	24 Emergency Landing Conditions – Fwd (4.0g)	N/A			Forward deflection or failure of basket poses no threat to occupants.
27.561(b)3(iii)	24 Emergency Landing Conditions – Side (2.0g)	Analysis and Test iaw AC 43.13-1A		X	
27.561(b)3(iv)	24 Emergency Landing Conditions – Down (4.0g)	Compliance with 27.337		X	27.337 Manouvering Load is Critical.
Subpart D – Design and Construction					
27.601	24 Design	Drawings		X	Design is conventional.
27.603	24 Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5H.
27.605	24 Fabrication Methods	Drawings		X	Design is conventional.
27.609	24 Protection of Structure	Drawings		X	
27.611	24 Inspection Provisions	Drawings		X	Design is easy to inspect.
27.613	28 Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5H		X	
27.625	24 Fitting Factor	Analysis		X	
27.783	28 Doors	N/A			Installation does not block doors.
27.787(a)	24 Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	
27.787(b)	24 Cargo and Baggage Compartments	Design		X	Basket is a closed container.
27.787(c), (d)	24 Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.
27.807	28 Emergency Exits	N/A		X	Installation does not block doors.
27.865(a)	28 External Load Attaching Means	Compliance with 27.337		X	
27.865(b), (c)	28 External Load Attaching Means	N/A			
27.865(d)	28 External Load Attaching Means	N/A			Failure of an attachment does not endanger the rotorcraft.
27.1387	24 Position Light System Dihedral Angles	N/A			No change from Type Approval.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof		Form of Substantiation	DOT	DAR	Comments
Paragraph	Amdt.					
Subpart G – Operating Limitations and Information						
27.1505	24	Never Exceed Speed	Flight Test, Flight Manual Supplement (if req'd)	X		0.9 V _d that can be achieved in flight test with basket installed, if less than basic V _{ne} . Limited to VFR only.
27.1525	24	Kinds of Operation	Flight Manual Supplement	X		
27.1529	24	Instructions for Continuing Airworthiness	Maintenance Manual Supplement	X		
27.1557(a)	24	Miscellaneous Markings and Placards – Baggage Compartments	Placard		X	
27.1557(b)	24	Miscellaneous Markings and Placards	N/A			
27.1557(c)	24	Miscellaneous Markings and Placards	N/A			
27.1557(d)	24	Miscellaneous Markings and Placards	N/A			
27.1581	24	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
27.1583(c)	24	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
27.1585	1	Operating Procedures	Flight Manual Supplement	X		
27.1587	1	Performance Information	Flight Test, Flight Manual Supplement (if req'd)	X		Effect (if any) of basket installation on performance. Placard installed on basket lid and beams.
27.1589	24	Loading Information	Flight Manual Supplement & Placard	X		
Airworthiness Manual Requirements						
527.1581(e)	Rotorcraft Flight Manual – Units		SI and Imperial Units provided in Flight Manual Supplement	X		



SERVICE DIFFICULTY ALERT

ALERTE AUX DIFFICULTÉS DE SERVICE

The purpose of this Service Difficulty Alert is to bring to your attention potential hazards that have been identified by the Service Difficulty Reporting Program.

Recent reports indicate that the following condition(s) may exist with your aircraft.

Cette Alerte aux Difficultés de Service a pour but d'attirer votre attention sur des conditions possiblement hasardeuses qui ont été révélées par le Programme de Rapports de Difficulté de Fonctionnement.

Des rapports récents indiquent que les conditions suivantes pourraient exister sur votre aéronef.

BELL HELICOPTER TEXTRON MODEL 206 A/B/L

BELL HELICOPTER TEXTRON MODELE 206 A/B/L

Recent Operation Safety Notices (numbers OSN 206-86-16 and OSN 206L-86-14) have been issued by BHTI requiring no equipment to be attached to the landing gear skids or cross tubes as the natural frequency of oscillation may be changed sufficiently so as to induce fatigue cracking at the cross tube/fuselage attachment points.

Discussions with BHTI have revealed that the crack propagation rates are such that a daily visual inspection would be sufficient to find the cracks before failure. However a more detailed inspection every 100 hours would be more suitable.

It is therefore recommended that, on aircraft with any equipment attached to the landing gear skids not supplied or recommended by Bell Helicopter, a visual inspection daily or an ultrasonic inspection be performed every 100 hours for cracks in the cross tube/fuselage attachment points paying

De récents Operation Safety Notices (OSN 206-86-16 et 206L-86-14) ont été publiés par Bell Helicopter Textron, Inc., indiquant qu'il ne fallait fixer aucune pièce d'équipement aux patins ou aux traverses tubulaires, car la fréquence naturelle des oscillations pouvait changer au point d'induire des criques de fatigue aux points de fixation reliant les traverses au fuselage.

Des entretiens avec Bell Helicopter ont révélé que les vitesses de propagation des criques étaient telles qu'une inspection visuelle quotidienne suffirait à les déceler avant que se produise une défaillance. Néanmoins, une inspection plus détaillée aux 100 heures serait plus indiquée.

Par conséquent, sur tous les hélicoptères aux patins desquels on a fixé de l'équipement non fourni ou recommandé par Bell Helicopter, il est recommandé de procéder à une inspection visuelle quotidienne ou à une inspection aux ultrasons toutes les 100 heures pour déceler des criques aux points de fixation

167-8

FILE NO.
100-10-2-2

5010-10-2-2

MESSAGE

85 FEB 25

COMPLETE THIS SECTION
FOR COMMERCIAL
MESSAGES ONLY.

REPLIR CETTE PARTIE
POUR MESSAGES COM-
MERCIAUX UNIQUEMENT

CHARGES
A10245

DATE

FEBRUARY 22, 1985

ORIGINATOR - AUTEUR

L.V. GALVIN

DESIG. - SIGLE

ABF/L

TEL. - TEL

0-1245

PAGE 1

OF
DE

3

FACSIMILE
d'/from OTTAWA

PAGE 1 de/ of 3

WRW EDMONTON

ATTENTION: A.E. SUTHERLAND

BF 85/03. SUBJECT: HELISKI MODIFICATION

BELL 206L (GQEZ) AND XX 206L-1 (GERI)

REFERENCE: YOUR WRW-042 DATED FEBRUARY 15, 1985.

TRANSPORT CANADA FLIGHT TEST INSPECTION OF THE SUBJECT MODIFICATION WAS CONDUCTED IN CALGARY, ALTA. ON 206L C-GQEZ, ON FEB. 21, 1985.

THE FLYING QUALITIES OF THE SUBJECT AIRCRAFT WERE NOT SIGNIFICANTLY EFFECTED BY THE HELISKI BASKET AND FROM A FLIGHT TEST STANDPOINT APPROVAL OF MODIFICATION IS RECOMMENDED SUBJECT TO THE FOLLOWING:

A) A SUITABLE FLIGHT MANUAL SUPPLEMENT BEING PREPARED CONTAINING THE FOLLOWING:

i) LIMITATIONS - VFR OPERATIONS ONLY

- FLIGHT MUST BE CONDUCTED WITH ALL DOORS ON

FACSIMILE
d'/from OTTAWA

PAGE 2 de/ of 3

MAXIMUM LOAD IN THE BASKET XXXXXX 100 LBS (45.4 KG)
BASKET LID MUST BE SECURED IN THE CLOSED POSITION
FOR ALL FLIGHT OPERATIONS.

ii) ADD A CAUTION TO THE EFFECT THAT "INAPPROPRIATE LOADING OF THE HELICOPTER COULD RESULT IN LATERAL CG LIMITS BEING EXCEEDED.

WITH ANY LOAD IN THE BASKET PASSENGERS SHOULD BE SEATED FAVORING THE LEFT SIDE OF THE CABIN/COCKPIT. IF LATERAL CG MAY BE CLOSE TO THE LIMITS A PRE-FLIGHT CALCULATION MUST BE CARRIED OUT".

iii) PROCEDURES - TO BEFORE TAKE-OFF CHECK - ADD "BASKET LID - SECURE".

iv) WEIGHT AND BALANCE - INCLUDE THE WEIGHT AND MOMENT OF THE BASKET MODIFICATION (EMPTY-BASKET) AND THE CENTROID OF THE BASKET (LONGITUDINAL AND LATERAL) TO AID IN DETERMINING THE EFFECTS OF LOADING THE BASKET.

NO STEP
MAX LOAD 110 POUNDS LOAD
MUST BE DISTRIBUTED AND
LIE BELOW BASKET PROFILE
TO ENSURE DOOR CLEARANCE

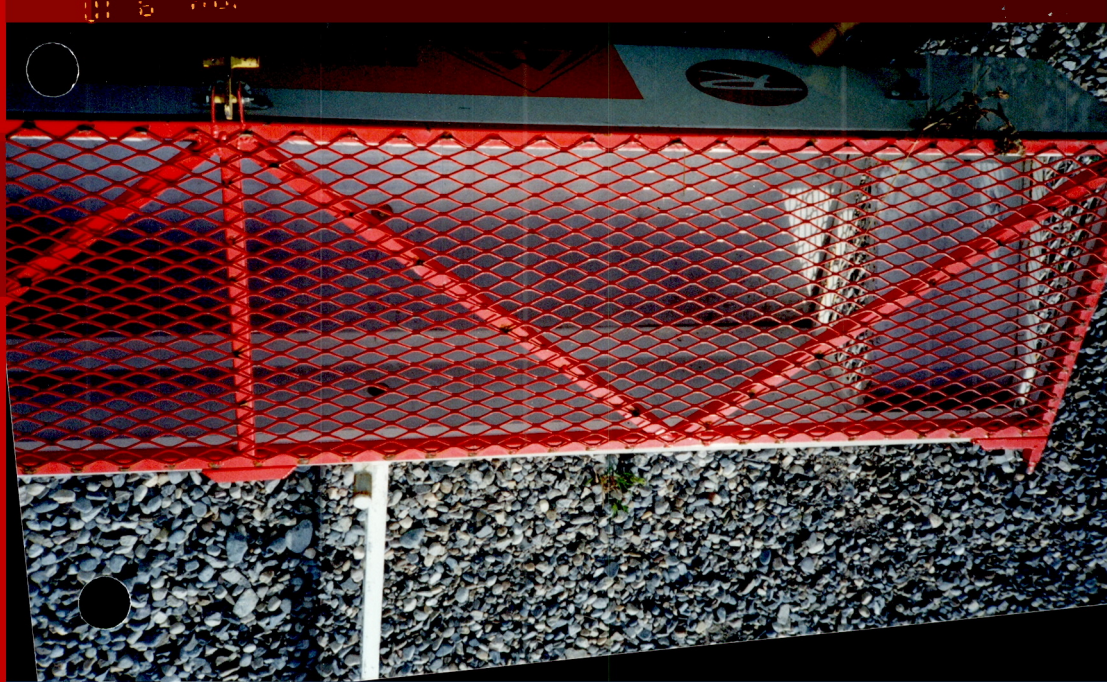


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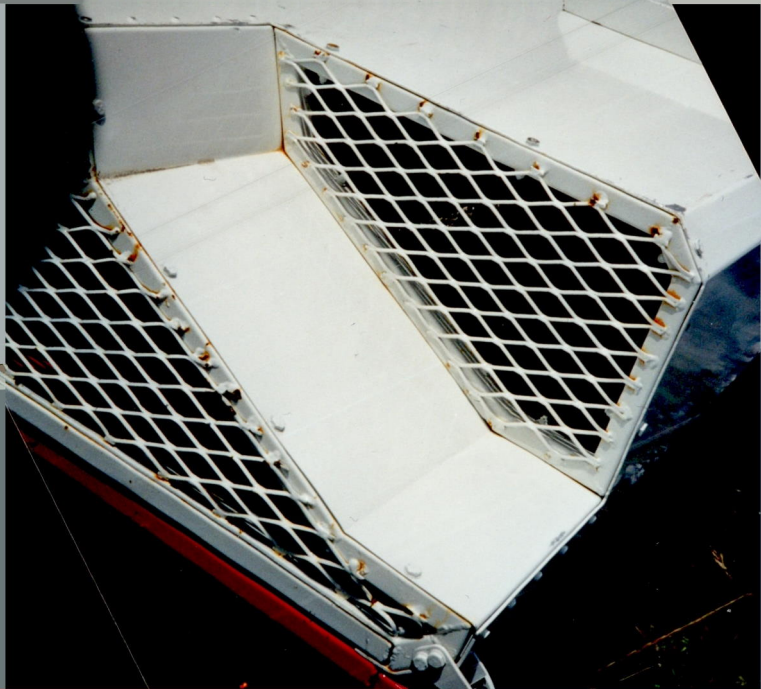
















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